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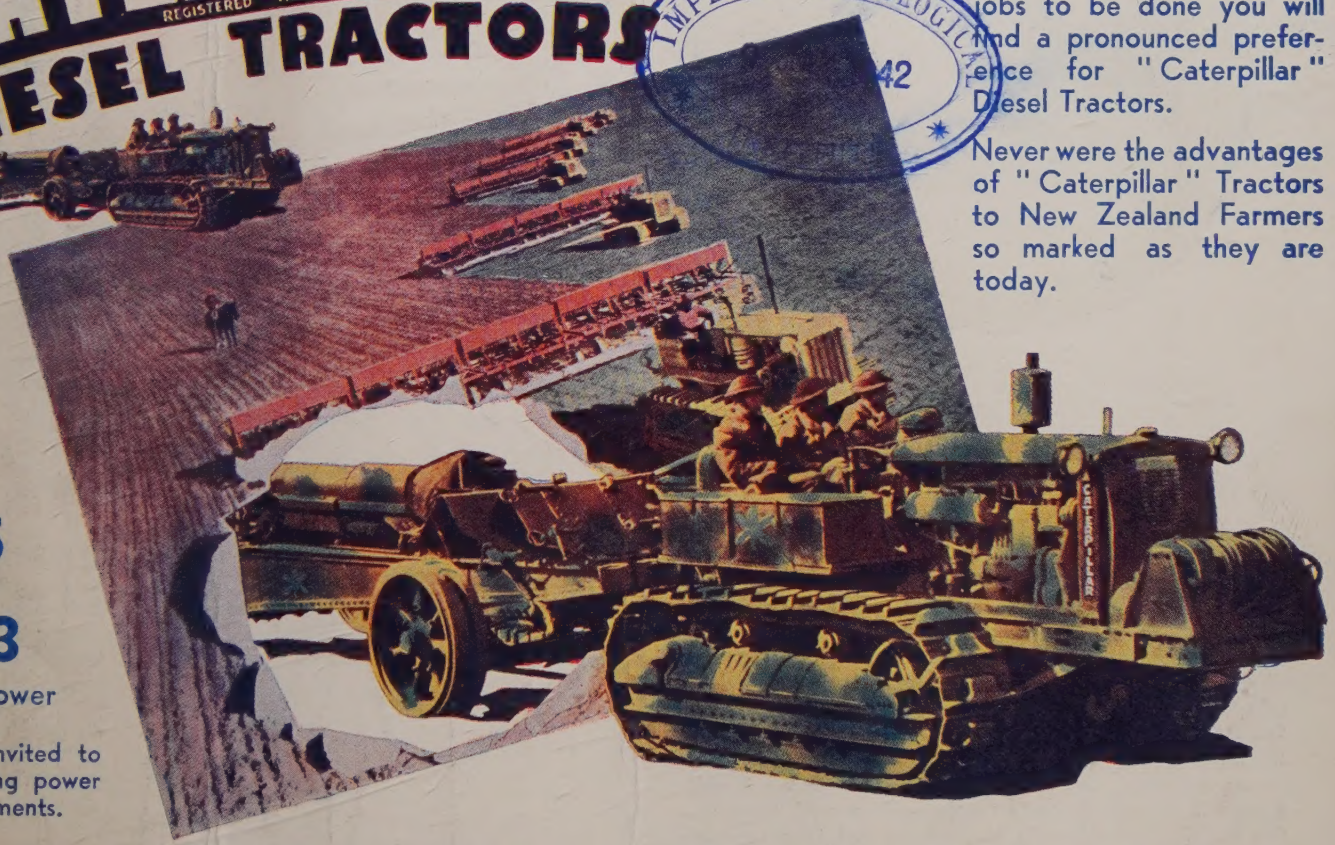

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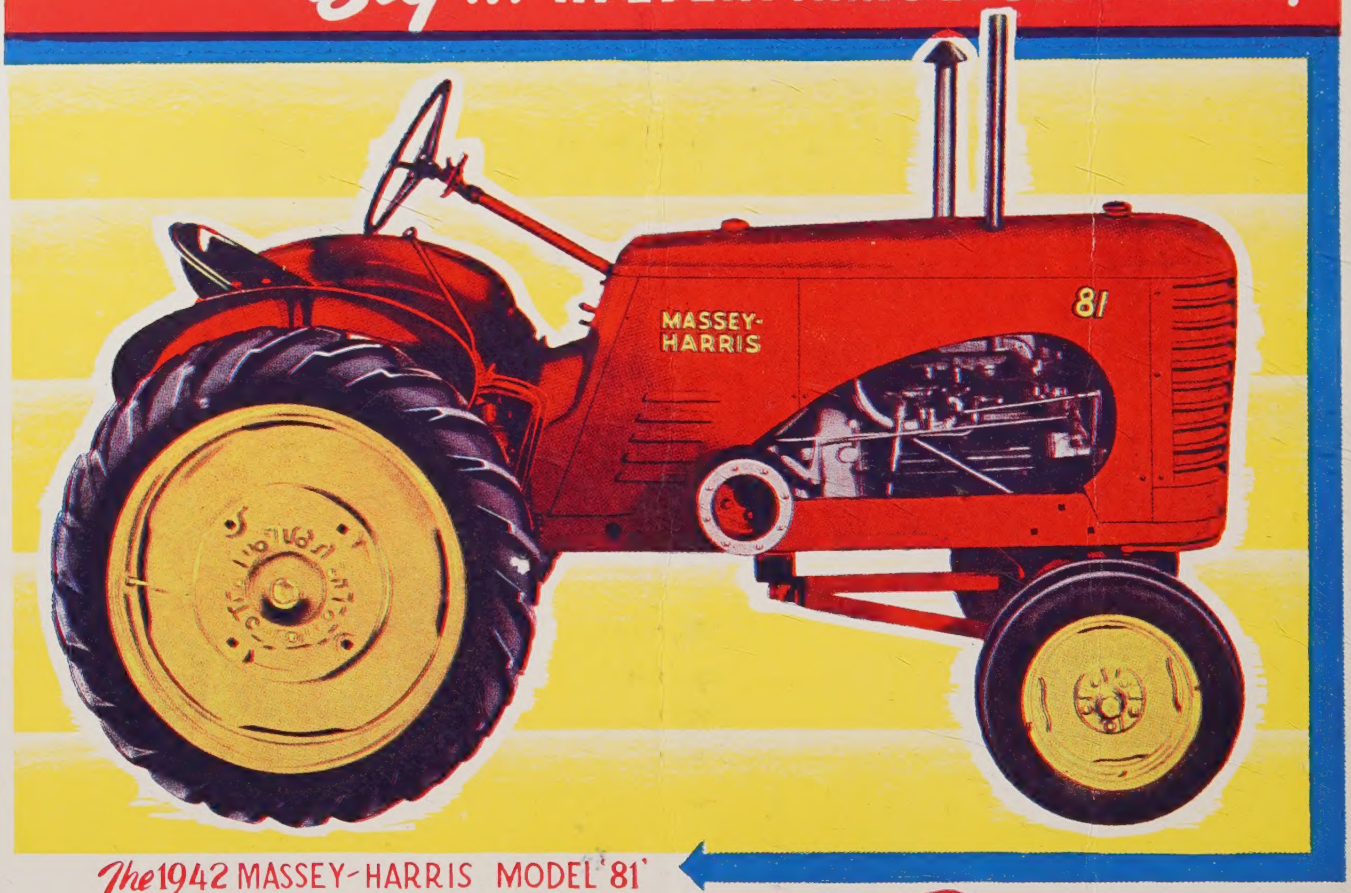

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Published by direction of Hon. J. G. Barclay, Minister of Agriculture.

A Vegetable Garden on the Farm Means Health and Wealth

"There is no artificial substitute for vegetables." — Prof. Priestly, Professor of Bio-Chemistry, Sydney, N.S.W.

"One of the most interesting duties of the housewife is undoubtedly the selection of vegetables for her family. Some women are privileged to pick the fruit from their own garden, and what a pleasure it is. Rows of green leaves of spinach, carrots and parsley, the runners of luscious green beans, the firm blue-green cabbage heads, and beautiful red tomatoes. Yet this is not all, the bright colours of carrots, beetroot and turnips are still underneath the ground. With all these riches it should not be difficult for the housewife to visualise the delicious and attractive meal which she will serve to her family. **Such young fresh vegetables have always been and always will remain the best foundation of the meal for flavour as well as nutritive value."** — *Miss S. Waude, in "Farming in South Africa."*

By
D. K. PRITCHARD,
Instructor in Vegetable Culture, Wellington.

FROM information gained through recent investigation, it would appear that the time is opportune for directing the attention of our farming community to the desirability, if not the absolute necessity, of giving more and ever more attention to the farm vegetable garden.

Apart from the devastating effects of the war, there is another war being waged by our agricultural and medical scientists and nutritionists against influences which are manifested by what appears to be an increase in human disabilities. This, surely, is apparent by the increased and increasing populations of our hospitals and sanatoria.

Never before have the students of our advanced medical science been so positive in their affirmation of the necessity for the increased consumption of potatoes and green vegetables. Today it is an accepted fact that what may be consumed as food may not altogether be "food" if this is defined as "that which supplies to the human body the greatest proportionate amount of nutriment." It is indeed possible to starve in the midst of plenty.

In a book published in Great Britain last year, "Feeding the People in Wartime," by Sir John Orr (who is recognised as one of the world's leading authorities on nutrition) and David Lubbock, this statement appears:— "With sufficient milk, vegetables and potatoes there need be no malnutrition." (The position of "vegetables" should be noted, the physical value of which will be dealt with later.)

Planning

With the adoption of the home garden—and this should be an important adjunct to the economy of every farm —it is recommended that a definite plan be adopted and adhered to. The most important objective of such a plan would be the continuous supply of fresh vegetables.

Location

As most of the garden work will be done during odd moments by members of the farm household, the area set apart should be conveniently situated to the homestead. Such a position would no doubt induce "the hand that rocks the cradle" to spend some time occasionally "pottering about among the vegetables."

A light soil with a northerly or north-easterly aspect will warm more quickly in the spring, which would enable planting of early-maturing crops to be undertaken sooner than if the soil were heavy. It will be of great value during dry spells if a good water supply is near the garden site. If no natural protection obtains, artificial shelter should be provided, and young hedges planted as soon as possible. Early production of the best vegetable crops cannot be expected if the garden is exposed to cold southerly wind and rain.

Lay-out

For convenience of cultivation and economy of production, it will be an

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advantage to plant the crops in long rows rather than in beds. When planting potatoes, cabbage, etc., there should be enough space between the rows to permit horse cultivation. When growing lettuce, spinach, beetroot, etc., sufficient distance should be allowed between the rows for the use of a hand-operated wheel-hoe, which is a highly efficient implement for cultivating these and other crops similarly grown.

Maintaining Soil Fertility

If the garden is looked upon as an industrial undertaking, the soil will constitute the machinery by which the output may be maintained, and the necessity for it being kept in the best possible condition must be obvious. If plenty of well-rotted manure, preferably the stable output, is available and applied in liberal quantities, there should not be any great need for the use of artificial fertilisers.

Phosphoric acid—a necessary and indispensable vegetable plant nutrient—is likely to be in short supply in the soil, as it is in almost all animal manures, and an occasional dressing over the garden of superphosphate at the rate of 2 to 3 oz. per square yard would be beneficial. In addition, and at the beginning of each gardening season, an application of blood and bone fertiliser at the rate of 3 oz. per square yard, together with a small quantity of potash (sulphate or muriate), would materially assist in the maintenance of soil fertility. The blood and bone contains water-insoluble plant nutrients, and will last much longer in the soil than those which may be water-soluble. If potash is unobtainable—and whether it is or not—it will be an advantage to save all available supplies of wood-ashes and soot for future application to the garden. Wood-ashes are valuable for their potash-content, and soot, in addition to its nitrogen-content, is valuable for the destruction of such pests as slugs.

Lime is as necessary to the garden as it is to any other part of the farm land, and a dressing of carbonate of lime once a year at the rate of half a ton per acre should prevent the development of acid conditions in the vegetable cropping area. This is best applied just before planting the crops.

Cropping

Should the area of the garden be restricted, it may be necessary to have a succession of crops of different varieties following each other on the same piece of land during the same season. Savoy cabbages may follow early potatoes, and French beans may follow early lettuce; similarly, early spring cabbage may be followed by main crop tomatoes. Seed for such crops as lettuce, spinach and radishes may be sown every three weeks, so that a continuous and fresh supply of these (especially the first two) particularly desirable vegetables may always be available.

This system, which is known as "succession cropping," will, of necessity, rob the soil of considerable quantities of plant food, which must be replaced if vegetables of high quality are to be produced. In this connection it should be realised that, when the time of growing and maturing green vegetables is unduly prolonged, the edible portions become stringy and develop an undesirable and unpalatable flavour.

As this article only deals with the vegetable production of the farm garden, it is competent to define the advantages which may accrue to the home-life of the farm as economic and physical.

Economic

If it is assumed that the gross financial return from the average dairy farm is £10 per acre, what return may reasonably be expected from a similar area of land of the same quality utilised as a vegetable garden? (The unit referred to can be modified to suit the requirements of individual farmers.)

One-third of the acre may be sown with a green crop for manure purposes, and one-third planted to potatoes—a small part with an early variety, and the balance in a main crop. The remainder of the area can be utilised as the vegetable section. This would establish a three-year crop rotating system.

Nominally, the area suggested should produce 25 cwt. of edible potatoes; actually, it ought to be much more. This estimate is just half the average per acre production of Dominion crops. If, for five adults, the daily consumption of potatoes is 5 lb., this would use 16⅓cwt. during the year, and leave 8¾cwt. to be sold or fed to stock on the farm. The cost of production at current prices, including Government certified mother seed, fertiliser and spraying, would be about £6, and, taking the low estimate of £10 as the landed cost on the farm of 1¼ tons of potatoes, a credit balance of nearly £4 is seen.

An allowance of 8d. per week per head — surely not an exaggerated amount—for vegetables for the family of five adults would mean an annual expenditure of £8 13s. 4d., and, assuming that the production of vegetables from the farm garden was, at least, the equivalent of this amount, it will be readily seen that the vegetable garden is, as an economic unit, the equal of any part of the farm of similar dimensions.

It should be remembered that vegetables purchased from a retailer will be loaded with the price realised at auction, and, in addition, marketing and retail charges. Should the retailer be the producer, as sometimes happens, the price charged must at least

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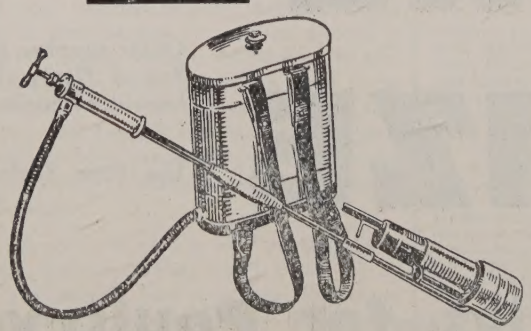

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Physical

The foregoing is a brief reference to the economic relationship of the vegetable garden to the farmer as a whole. What, it may be asked, is its value to the health of the farm family? Unfortunately, the nutritional value of vegetables produced and consumed on the farm cannot be measured by any monetary standard. If this were possible the products of the farm garden would be more highly appreciated. It is not, perhaps, as widely known as it might be that once the edible portion of a green vegetable is separated from the growing stem the process of deterioration begins, and the greater the length of time that elapses between cutting and consumption the faster the rate of deterioration proceeds, until finally the vegetable becomes unfit for human food. A news item which recently appeared in the New Zealand Press intimated that scurvy had made its appearance in Great Britain, no doubt due to a scarcity of green vegetables, which contain the antiscorbutic Vitamin C.

The accompanying table gives a summarised indication of the nutritional value of some varieties of vegetables in accordance with their vitamin content.

Distribution of Vitamins in Various Vegetables.

Vegetables.	Vitamins. A.	B1.	B2.	B.	C.
Asparagus	—	—	—	—	—
Green Beans	+	—	—	—	+
Beans	—	—	—	+	—
Carrots	+	—	—	+	—
Raw Carrots	+	++	+	—	++
Cabbage	—	—	—	+	+
Raw Cabbage	—	—	—	—	+
Celery	—	—	—	—	+
Kumaras	+	—	—	—	—
Lettuce	++	++	+	—	+++
Onion	0 to +	—	—	++	—
Green Peas	+	—	—	—	+
Peas	—	—	—	+	—
Spinach	++	+	++	—	+++
Tomatoes	++	+	+	++	+++
Orange Juice	+	—	—	+	+++
Turnip Root	0 to 1	+	+	—	—
Turnip Leaf	++	—	++	++	++

In addition to their vitamin-content, green and leafy vegetables supply to the body quantities of iron, iodine, protein and lime. They are also particularly valuable as laxatives.

The outstanding position of spinach and tomatoes should be noted, and attention directed to the fact—and it is one worthy of appreciation—that, although the vitamins in nearly all vegetables are adversely affected by cooking, those of the tomato are practically unaltered. Is it any wonder that the tomato has been described as the "poor man's orange."

Production Programme

In endeavouring to outline a production programme which might be followed in order to realise in practice the objectives aimed at in this article —to stimulate interest in the production and consumption of vegetables on

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the farm—the outstanding difficulty is that of evolving a scheme which would be applicable to all parts of the Dominion. In a general way, an indication of group planting is given below. The crops which constitute each group are dealt with in the Home Garden Notes of the "Journal" as fully as space permits.

(1) Early Spring Planting.—Lettuce, spinach, turnips (early varieties), silver beet, peas, cauliflower, onions (salad and main crop), cabbage (summer), radish and carrots (early).

(2) Main Crops for Planting in Late Spring or Early and Mid-summer.—Potatoes, cabbage (savoy), cauliflower, borecole, Brussels sprouts, carrots, parsnips, peas, lettuce, beetroot, celery, tomatoes.

(3) Crops liable to damage by Light Frosts.—Tomatoes, beans, pumpkins, marrows and all gourds, kumaras.

(4) Crops to plant Late Summer and Early Autumn.—Savoy cabbage (late), spring cabbage, swede turnips.

(5) Perennials.—Parsley, rhubarb, asparagus.

Factors Contributing To Success

Diseased plant residues should never be dug or ploughed into the garden; they should be burned.

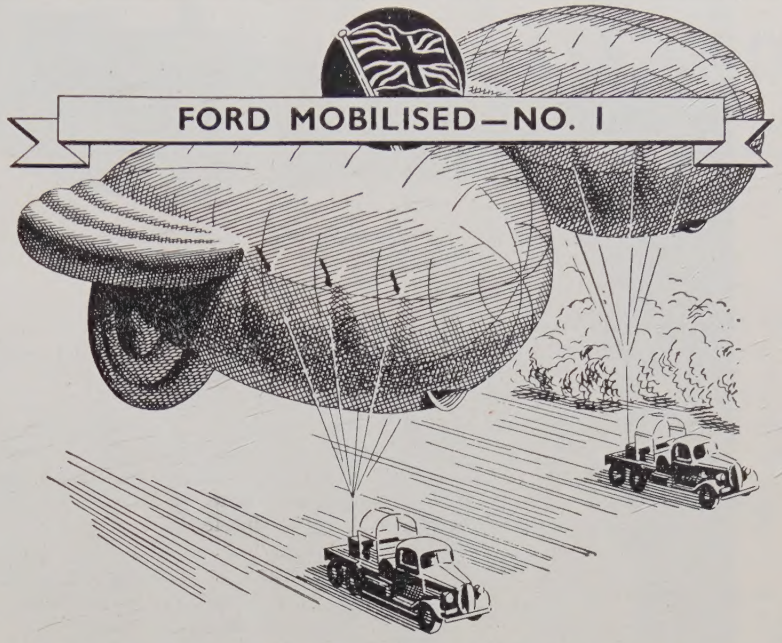
When making a compost heap, use only material free from disease, supplemented with animal manure, soil and small quantities of artificial fertilisers.

Buy only the best seed; this is the basis of all crop production, and always the objective should be to grow quality produce. Only vegetables of the highest grade should be good enough for the farm family. Good seeds, however, will not produce best results unless proper methods of cultivation are adopted.

The substance of the foregoing remarks must not be construed into accusations of neglect or indifference on the part of the farmer; rather are they intended to direct the attention of our farming community to the advantages which may reasonably be expected by the farm family from increased vegetable production and consumption.

It may be that "time is the alchemist which heals the wounds of war," but no alchemist can heal the constitutional weaknesses produced by the continued process of unbalanced and improper dieting, and time but accentuates and accelerates the deterioration of the human framework built from material of which a large proportion has been proved unsuitable for its durable construction.

The old adage still holds good; it is still a fact that "the true wealth of a nation lies in the health of its children." Greater production and consumption of vegetables on the farm will not only maintain but will also increase this most desirable and necessary form of wealth.



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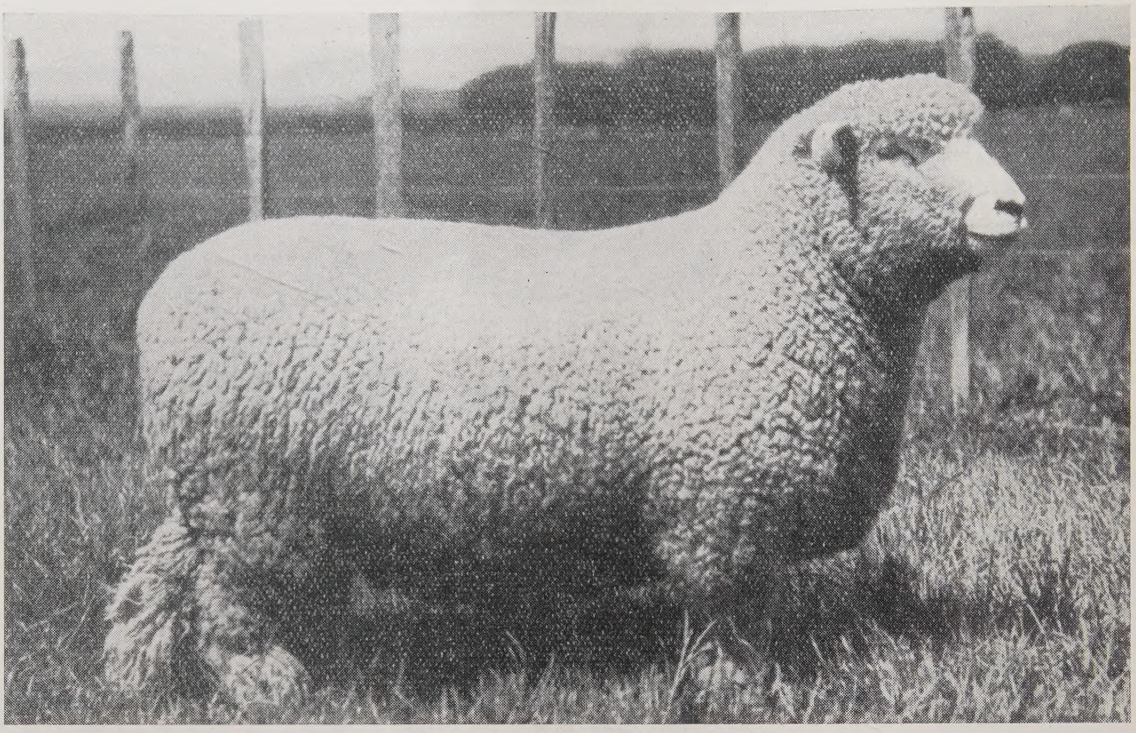

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The investigation described in this article deals with the response which may be expected from the application of ground limestone to pastures in the main farming districts of the Dominion. This work has been carried out over the past 15 years

LIME RESPONSES ON GRASSLAND

by means of over 1,400 small-scale observational trials which have been laid down throughout the length and breadth of both Islands. The results from these plots have been checked against accurate pasture-mowing trials.

— By —

A. G. ELLIOTT, Crop Experimentalist, and P. B. LYNCH, Assistant Crop Experimentalist, Fields Division.

THE problem of assessing the response of New Zealand's grassland to lime could be met only by a large-scale investigation, and to this end the "response survey" method of using large numbers of small-scale trials has proved an outstanding success. There is no doubt that the problem has merited such attention, because a large proportion of the soils of the Dominion are deficient in lime. Moreover, at the present time, when we are forced back on our own resources, the maximum and most efficient utilisation of our output of ground limestone assumes even greater importance than formerly.

The survey will be confined to the use on pasture of ground limestone (carbonate of lime) as distinct from burnt or slaked lime. Although, of course, the latter forms will give at least as efficient results as the carbonate, their use is on a restricted scale due to the variation in composition of the product, the unpleasantness of the material to handle, particularly in the case of burnt lime, and the higher price. Where cartage costs are heavy, however, in certain circumstances it may be advantageous to use burnt lime, as it is more concentrated than the carbonate, and 11 or 12 cwt. of a good product should give equivalent results to 20 cwt of ground limestone.

Articles by the authors in previous issues of the "Journal of Agriculture" of February and June, 1941, have examined the value of ground limestone in respect of its fineness of grinding and hardness of rock, and also have analysed the problem of the most effective method of applying lime. In the former case it was found that the average commercial limestone was a perfectly satisfactory product provided its purity was sufficiently high and that it was ground sufficiently finely to enable 50 per cent. of the material to pass through a sieve with 30 meshes to the inch. In the latter instance an application of 1 ton of lime every four years was recommended for the Marton soils, which have a fairly high lime requirement. In the trials to be examined, good samples of commercial limestone were used, and these were applied at the rate of 1 ton per acre as an initial dressing when the trial was laid down and 5 cwt. per acre as an annual dressing subsequently.

Layout of Trials

Although these trials vary according to the comparisons being made, the standard "L.P.K." lay-out which has been used in the majority of cases involves the crossing with lime of four plots—(1) No manure; (2) superphosphate; (3) superphosphate plus potash; and (4) potash—to give eight treatments in all, namely, the four treatments as given both with and without lime. The response to lime has been measured as the difference in the response of superphosphate plus lime from that of superphosphate alone or, where a marked potash response has been observed, the difference taken has been of superphosphate plus potash plus lime, between superphosphate plus potash. The effect of possible deficiencies of phosphates or potash is overcome by such comparisons.

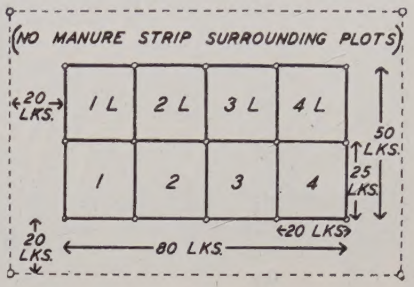

Fig. 1.—Diagram of the layout of an L.P.K. manuring trial. 1: No manure. 1L: No manure + lime. 2: Super. 2L: Super + lime. 3: Super + potash. 3L: Super + potash + lime. 4: Potash. 4L: Potash + lime.

Trials are observed four times in each year, and are laid down for a minimum of three years. Each plot is compared in turn with the "no manure" strip which surrounds the plots, and each trial is laid down in duplicate in the same field. This gives many comparisons, the agreement between which is important in assessing the reliability of the trial. Many factors operate to confuse the observer, who has to be trained not only to recognise sward differences, but also to

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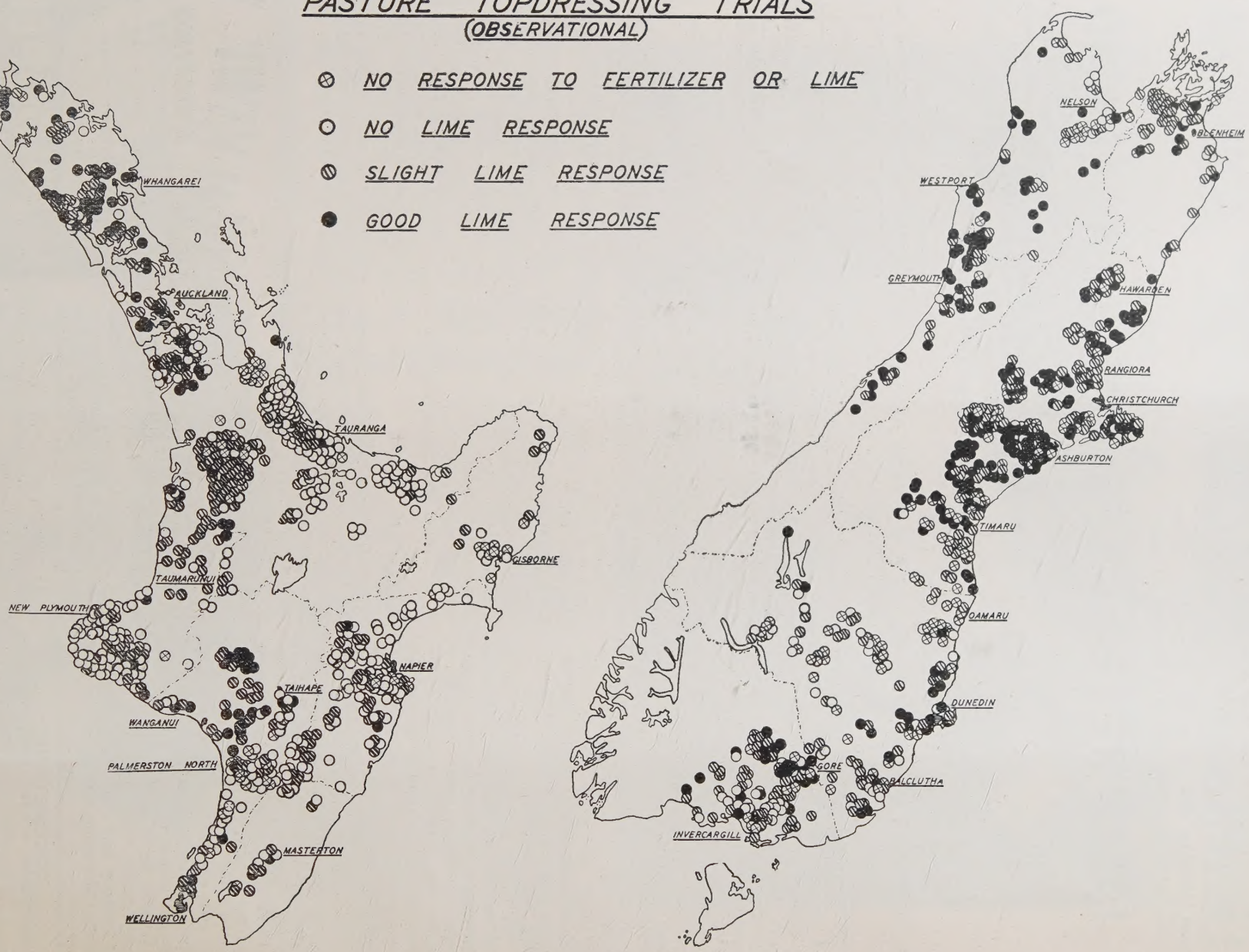

examine such differences in the light of other features, such as the type of sward, the system of farm management, the effect of stocking, the time of making observations, the uniformity of soil and pasture, and the history of the trial area, and he has to avoid carefully any personal bias.

Large numbers of trials are required not only to ensure a coverage of all districts, but also to give sufficient results so that the effect of the foregoing sources of variation may be examined and eliminated. A system of numerical "points" is adopted, by means of which the observer allocates a figure to each treatment according to the degree of response shown by the plot. The points so allocated are later summarised and used in making the treatment comparisons.

Mowing Trials

Mowing trials are replicated trials, usually carried out under the "mowing and grazing technique" devised by Hudson, and these have been laid down at Ruakura and at Marton. In all cases, agreement was secured between these trials and the observational trials. Briefly, the mowing trials have indicated three main features concerning the response of pastures to lime, namely:—

1. The greatest response occurs in the summer and autumn period when clover production is greatest, due probably to the marked stimulation of clover growth by lime.

2. The response to heavy lime applications is usually greatest in the second year after application, but is generally marked for four or five years or even longer.

3. An increase in production of from 20 per cent. to 25 per cent. can usually be observed as "slight" and one of from 40 per cent. to 50 per cent. as "marked." However, this very largely depends on the type of sward, the species responding, and the time of the year, and is based merely on personal opinion derived from numerous observations made before cutting the plots for weighing.

Lime Responses In Different Districts

The maps which accompany this article should be examined in conjunction with the following survey. Each circle on the map represents an observational trial, and the lime response observed on that trial is indicated as described. The result is a picture of the responses throughout the Dominion. It will be noted that there is a definite grouping of certain types of response into districts, and here is seen the value of the survey.

Eventually, it is hoped to relate these responses to the soil by means of the soil survey maps, and when this work is completed it will be possible to define accurately the areas on which lime is required, and also probably to give more exact recommendations regarding the amounts of limestone and other fertilisers to apply. The present survey is preliminary in the sense that this section of the investigation has been completed only in one or two districts. Where the responses as shown by the trials have been examined in the light of probable soil requirements as indicated by the soil survey, very satisfactory agreement has in most cases been reached. Additional work which it is hoped to complete eventually involves the analysis of the herbage to examine the uptake of nutrients by the plants in relation to the type of soil and the type of treatment applied.

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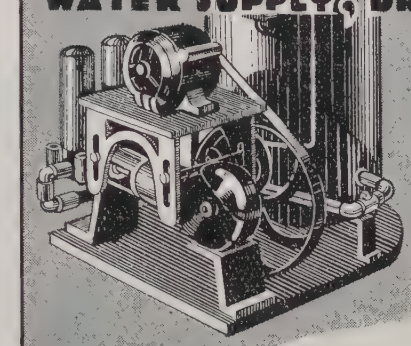

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NORTH ISLAND

(a) North Auckland

In general, this district shows marked responses to lime. The area is a patchwork of different soils, however, and while the gumland soils, brown clays, and ironstone soils respond extremely well to lime, some of the alluvial flats, as at Dargaville, and the sandy coastal soils, show little effect from such treatment (see the "Journal" for March, 1940). The proportion of soils not requiring lime is low. Considering the district total of 102 trials, 50 show good lime responses, 35 show slight lime responses, and 17 show no effect from lime—that is, a lime response was obtained in 83 per cent. of the trials.

(b) Central Auckland

Many of the soil types found in this district are also common further north, and consequently the manurial responses are similar to those in North Auckland. There are large areas of red-brown volcanic soils which respond to lime, and, in general, heavy applications of limestone should be made on all soils except possibly on the fertile river flats and coastal sands. Out of 40 trials, 15 show good lime responses, 10 show slight lime responses, and 15 show no response to lime—that is, 62.5 per cent. of the trials indicate the need for liming.

(c) Waikato

This district is fortunate in that a detailed soil survey of a typical section —the Waipa County—was followed by a comprehensive manurial research programme involving both mowing and observational trials. Consequently, the district can now be accurately divided into areas according to their fertiliser requirements (see the "Journal" for January, 1940). The soils of the district include peats and peaty soils and volcanic loams and clay loams which show variations according to the ash shower from which they are derived. Lime responses have been obtained on all of these soils, but the dressing required is not as heavy as that needed further north, particularly on the lighter soils. An application of from 10 cwt to 20 cwt of ground limestone every three to four years should be adequate. In 64 trials, 1 shows a good lime response, 46 show slight responses, and 17 no responses to lime, so that 73 per cent. of the trials have indicated some degree of lime requirement.

(d) Thames and Coromandel

Ten trials on the fertile marine silts of the Hauraki Plains have shown no responses to lime or fertilisers. On the hill soils of the Coromandel peninsular there is probably a greater need for lime, as one trial shows a good response, one a slight response, and one no response to lime. Further work is needed in this area before definite recommendations can be made.

(e) Bay of Plenty

Soils include leached pumice sandy loams (as at Waihi), free pumice sandy

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Fig. 2.—Showing the striking effect of lime on red clover. No lime was applied on the right.

loams of the hill country, free coastal soils also derived from pumice, free sandy pumice soils, and peaty loams. (See the "Journal" for December, 1941.) In practically all cases lime responses are small or absent. Nevertheless, light applications of limestone should not be discouraged, particularly in the older settled localities. Out of 104 trials, one showed good responses, 17 slight, and 86 no responses to lime, making only 17 per cent. of the trials indicative of a lime deficiency.

(f) Rotorua

This district largely comprises soils derived from recent pumice, and one would not expect such land to be lime-demanding. Out of 22 trials, only 6 show a slight lime response (27 per cent.), and these experiments are mainly located on the borders of the district where the pumice soils intermix with other types.

(g) Te Kuiti-Taumarunui

As one approaches the high-rainfall hill country of these districts, the lime response increases. The soils are subjected to considerable leaching, and are older than the pumice soils with which we have been dealing. The limestone country and the alluvial flats do not require lime to the extent of the clay loams of the hills. Altogether, 38 trials were laid down in this area, and 5 showed good lime responses, 23 slight, and 10 no responses to lime; thus, 74 per cent. gave positive results for lime.

(h) Taranaki

The soils of Taranaki are mainly derived from various ash showers of Mount Egmont, and differ from one another according to the nature of the original volcanic material. Although they are in a district of heavy rainfall, the soils are "young" and lime responses are correspondingly small or non-existent, except possibly in the country around Stratford, which is of comparatively high altitude. In Taranaki, out of a total of 79 trials, 4 gave good, 18 slight, and 57 no responses to lime, making 28 per cent. of the experiments indicative of the need for liming.

(i) Wanganui-Taihape-Ohakune

Except for the coastal region, this area receives a heavy rainfall, the altitude is considerable, and the majority of the soils are fairly mature and have been subjected to much leaching. Near Ohakune the soils are of a volcanic nature, and are very deficient in lime, a good response being obtained from lime in 10 out of 13 trials, and all 13 showing responses to the treatment. In the district as a whole, 22 trials out of a total of 52 gave a good lime response, 19 a slight response, and 11 no response to lime. Thus, 79 per cent.

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of the trials showed good results from liming in marked contrast to the neighbouring districts on both sides.

(j) Manawatu-Rangitikei

This district can be considered in two sections. The fertile Manawatu and Kairanga Plains show little or no responses to lime or fertilisers, but in the terrace country and on the Rangitikei Plains, such as in the Marton district, slight to fair responses to lime are obtained. At the Marton Experimental Area a 10 per cent. to 15 per cent. increase is usually obtained from the use of lime, but, as mentioned earlier, the response may greatly exceed this in the summer and autumn months. In the whole district there has been a total of 31 trials, and of these, 2 have shown good, 5 slight, and 24 no responses to lime, so that 23 per cent. of the trials gave a lime response. However, the majority of the trials not responding to lime were located on the alluvial plains.

(k) Woodville-Dannevirke

This part of southern Hawke's Bay has been considered separately, as it is a dairying district of high rainfall in contrast to the lower rainfall, sheep country of the rest of the Province. Lime responses are not marked because much of the country is of a fertile alluvial nature. Out of 25 trials, 10 show slight and 15 no responses to lime, 40 per cent. being indicative of a slight lime deficiency.

(l) Levin-Paekakariki

On the fertile Horowhenua Plains and the low altitude country of the coastal region generally, little lime responses are obtained either on the sand country or on the alluvial plains. The foothill country is, however, rather deficient in lime, as, in greater degree, are the hills between Wellington and Paekakariki. The district has had a total of 23 trials, 2 showing a good, 6 a slight, and 15 no lime response, but the percentage of trials showing the need for lime (35 per cent.) covers, as indicated, two types of country with different lime demands.

(m) Poverty Bay-Hawke's Bay-Wairarapa

The east coast sheep country of the North Island embraces very many soil types, as has been indicated in the soil survey of Hawke's Bay. Briefly, however, we may consider some of them as follows. The fertile

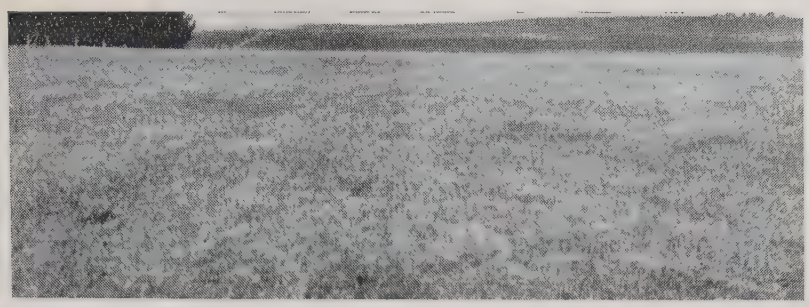


Fig. 3.—Showing the effect of lime on pasture—left: lime; right, no lime.

alluvial plains of Gisborne and Hastings show little or no response to lime or fertilisers. The limestone hill country which makes the best of the sheep districts, apart from the plains, in Hawke's Bay and the Wairarapa is not greatly in need of lime, nor are the pumice derivative soils to the north of Napier. Lime responses tend to be more marked in the foothill country, such as at Puketitiri to the west of Napier and in parts of the Wairarapa Plains. In other scattered localities, mainly in areas where the rainfall is heavier than the average and where the soils are more "mature," increased returns follow the use of lime. In the district as a whole, good lime responses have been observed on four out of 126 trials, slight responses on 34, and no effect from lime has been found on 88 trials. Thus, 30 per cent. of the experiments have indicated a lime deficiency.

SOUTH ISLAND

(a) Nelson

Soils of the Nelson district form three main types. These are the alluvial plains, which show little or no responses to lime, the clay loams of the eastern foothills and the clays of the Moutere Hills, both of which latter groups give marked responses to lime. It is therefore difficult to give a figure relating to the district as a whole, and most of the trials have been located on the intensively farmed flat country, where the detection of responses is difficult. Out of a total of 30 trials, 5 give good, 7 slight, and 18 no responses to lime. Thus, 40 per cent. of the experiments show the need for lime.

(b) Westland

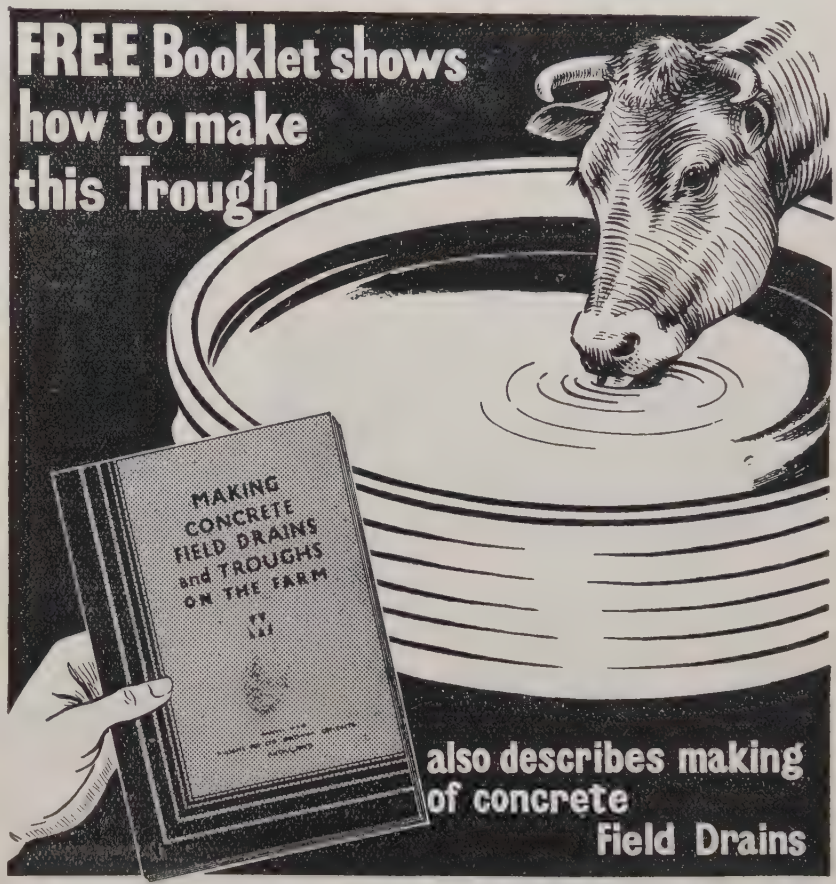
Including the Murchison district this area, subjected as it is to very heavy rainfall, has suffered severe leaching. Thus, marked lime responses are to be found throughout the whole district. Good responses were observed on 50 out of 77 trials, slight responses on 22, and only 5 showed no effect from lime, giving 94 per cent. of lime responsive experiments.

(c) Marlborough

The Marlborough Province may be considered in three sections—the higher country of the Sounds district, which gives good lime responses, the alluvial plains of the Wairau Valley and at Seddon, where responses are smaller but still definite, and the heavier rainfall country to the south showing more marked results from lime. Out of 48 trials, 8 have shown good, 36 slight, and 4 no responses to lime, and 92 per cent. of the experiments show that increased returns follow the use of this material.

(d) North Canterbury

The district surveyed is that centred round Hawarden. The soils on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... the hills and the valleys are lime-deficient, as is indicated by the fact that 23 trials out of 44 showed good, 16 slight, and only 5 no responses to lime. The percentage of trials giving lime responses was 89 per cent.

(e) Akaroa

The Akaroa Peninsula, although it carries many different soil types, is almost entirely lime-deficient country, as is shown by the fact that 14 trials show good lime responses and 7 slight, whereas no responses have been found on only 4 out of the total of 25 trials. The percentage of trials giving lime responses is 84 per cent.

(f) Canterbury Plains and Foothills

Trials have indicated marked responses to lime on practically the whole of this area, and some outstanding instances of the effect of liming on the Plains have been given in previous issues of the "Journal," the most recent being that of February, 1941 (page 99). Some of the very recent, heavier alluvial country along the banks of the rivers and near Christchurch may not be as responsive as the remainder of the Province, and there appears to be a small area near St. Andrews where less effect is obtained from lime. Nevertheless, by far the greatest area of the district responds very markedly to this dressing. Out of a total of 231 trials, 121 gave good, 70 slight, and 40 no lime responses, 83 per cent. showing the need for lime.

(g) North Otago

In marked contrast to the districts north and south, liming has given only small responses on much of the Oamaru country. Particularly, as would be expected, is this the case on the limestone hills and the river flats derived from this material. Good lime responses were seen on only 1 out of 21 trials, slight responses on 3 and none on 17, indicating that in but 19 per cent. of the experiments has the effect of lime been observed.

(h) Central Otago

This is a district where little or no effect has been seen from the use of fertilisers or lime. The soil types vary from the most fertile schists to the most barren deteriorated and eroded country, but the factor operating to prevent the responses showing is the lack of water. On irrigated land the effect of water is so striking that the response from fertilisers and lime is negligible in comparison, while where water is not applied, growth over the greater part of the year is so small as to be insufficient to show the effect of top-dressing. Of 48 trials laid down, 2 showed a good response, 13 a slight, and 33 no response to lime. Thus, only 31 per cent. of the experiments have shown any effect from liming.

(i) Dunedin-Balclutha

The majority of soils in this area are deficient in lime, good responses being observed on all farming land apart from the most fertile river flats. Out of 56 trials, 17 show marked, 22 slight, and 17 no lime responses, and 70 per cent. have been indicative of the need for liming.

(j) Southland

This area has long been the greatest user of lime, and trials have shown that there is every reason to apply the usual heavy lime dressings

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on most of the country. The experiments not showing marked lime responses are, in the majority of cases, located on land which has been heavily limed in the past, because it is difficult to find well-managed farms which have not been so treated. Further, the effect of such heavy liming lasts over a long period, sometimes up to ten years, so that many trials may unknowingly have been influenced by such dressings, and the percentage of trials—67 per cent.—responding to lime is therefore an under-estimation of the position. Of 106 trials, 33 have shown good, 38 slight, and 35 no responses to lime.

District.	Total Number of Trials.	Trials Showing: Good Lime Responses.	Slight Lime Responses.	No Lime Responses.	Percentage of Trials showing Lime Responses.
North Auckland ..	102	50	35	17	83
Central Auckland ..	40	15	10	15	62.5
Waikato	64	1	46	17	73
Thames-Coromandel ..	13	1	1	11	15
Bay of Plenty	104	1	17	86	17
Rotorua	22	—	6	16	27
Te Kuiti-Taumarunui	38	5	23	10	74
Taranaki	79	4	18	57	28
Wanganui-Ohakune ..	52	22	19	11	79
Manawatu-Rangitikei	31	2	5	24	23
Woodville-Dannevirke	25	—	10	15	40
Levin-Paekakariki ..	23	2	6	15	35
E. Coast—Nth. Island	126	4	34	88	30
North Island ..	719	107	230	382	47
Nelson	30	5	7	18	40
Westland	77	50	22	5	94
Marlborough	48	8	36	4	92
North Canterbury ..	44	23	16	5	89
Akaroa	25	14	7	4	84
Canterbury	231	121	70	40	83
North Otago	21	1	3	17	19
Central Otago	48	2	13	33	31
Dunedin-Balclutha ..	56	17	22	17	70
Southland	106	33	38	35	67
South Island ..	686	274	234	178	74

Summary

The accompanying table summarises the position with regard to liming in New Zealand.

Districts where the heavy liming of pasture should be a standard practice —assuming that the area is sufficiently accessible and of relatively easy topography—are North and Central Auckland, Waikato, Te Kuiti-Taumarunui, Wanganui-Ohakune, parts of the Woodville and Levin-Paekakariki districts, the heavy land of Nelson, and practically all farming land in the rest of the South Island except in North and Central Otago.

Acknowledgments

A survey of this nature depends wholly on the interest and skill of field officers, and the Instructors of the Fields Division have proved more than equal to the task. Thanks are also due to the officers of the Soil Survey Division, Department of Scientific and Industrial Research, for their helpful co-operation, and to the hundreds of farmers on whose farms the trials have been carried out and who have always been willing to assist in their management.

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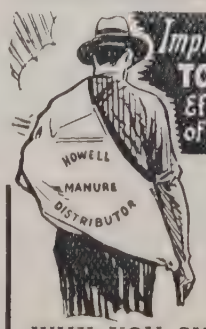

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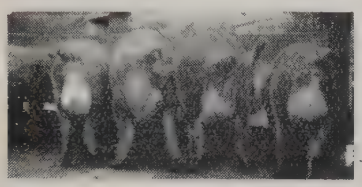
Last month's article described the castration of pigs in simple cases. Discussion this month centres on the castration of ruptured pigs, the after-effects of faulty castration, and necrotic sores.

CASTRATION OF THE RUPTURED PIG

Contributed by the LIVESTOCK DIVISION

THE castration of a pig affected with a rupture or hernia in the scrotal sac requires a different technique to that followed in the castration of the normal animal. The hernia is readily diagnosed by the size and swelling on the affected side. The swelling in this case is due to the sac containing some of the abdominal contents in addition to the testicle, the contents having passed into the sac through the canal containing the cord. It is obvious, therefore, that if castration is carried out as already described, not only the testicle, but possibly some quantity of small intestine will escape when the normal incision is made through the skin and other coverings. In order to avoid this, certain precautions and change of method of operating are necessary.

It is most important to have the ruptured pig well fasted before the operation in order to reduce the volume of the abdominal contents. It is also advisable to have the pig held with the head downwards so that the contents of the hernia may be returned to the abdomen before any incision is made. Careful manipulation of the sac will now reveal the testicle only. If the hernia has been in existence for some time the possibility of adhesions of the bowel in the sac makes the operation still more difficult. In the majority of cases, however, this complication is not present.



A number of pigs showing large abscesses following the operation. The need for care and cleanliness during the operation to avoid this result is apparent.

Before operating, it will be necessary to have some sterilised silk or fine cord available for tying the neck of the sac containing the testicle, and also for sewing up the skin wound to prevent any possible prolapse afterwards. The needles and silk are prepared by boiling beforehand.

Operation Described

Probably the best method of castrating the ruptured pig is to carry out carefully what is known as the "covered" operation. The pig is firmly held in position, as already described, so that the operator may make a careful incision without disturbance from the animal. The testicle is raised against the skin in the usual way. A careful cut is made through the skin only, the testicle being still covered by the lining of the scrotal sac. The testicle is not exposed in this case, but shows through its covering as a dull, purplish body. The testicle in its sac or covering is now separated from the skin and gradually drawn through the skin wound to enable the silk or fine cord to be tied as low down as possible. After making certain that this tying is well done, so that it will not slip off when the testicle is removed, the sac is opened and the testicle is now cut off. Before tying the sac or cutting, it is absolutely necessary

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Method of Castrating a Ruptured Pig

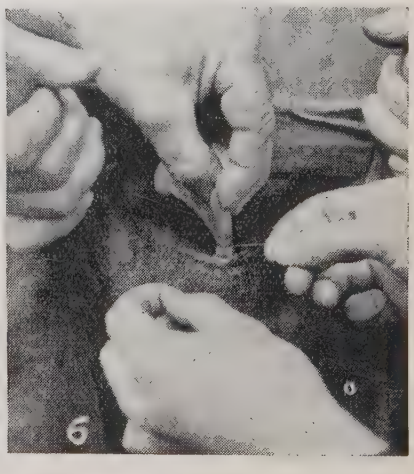
A one-sided scrotal rupture. Note the greater size of the left half of the scrotal sac.

Holding the pig in a suspended position to reduce the contents of the ruptured side. A careful incision is being made in the skin.

The testicle as it appears enclosed in its coverings when the covered operation is being performed.

Another view of the testicle enclosed in its coverings.

Tying the cord before cutting off the testicle along with its coverings.



When the cord has been securely tied, it is advisable to put a stitch through the substance of the cord to prevent any possibility of the tying slipping off the stump after removal of the testicle.

to ensure that no small loop of bowel is contained in the sac. When satisfied that the tying is secure, the protruding sac may be trimmed off close to the tying.

To finish off the operation, it is necessary to put a few stitches in the skin wound for support when the animal resumes its normal horizontal position. Such an animal should be fed sparingly for a few days to enable healing to take place before the abdomen again becomes distended. The pig should be kept confined in a small sty away from disturbance by other animals.

Another method of castrating the ruptured side when one testicle is normal is first of all to remove the normal testicle in the usual way. The testicle in the ruptured side is now released into the position vacated by the removed testicle through an incision in the septum or wall separating the two halves of the scrotal sac. The testicle is then removed through the skin wound used for the removal of the first testicle, the skin over the ruptured side being left intact. In order to prevent any possibility of protrusion of the bowel, it is advisable to stitch the wound. The after-treatment will be the same as when the covered operation is adopted.

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Pigs or Stags

It quite frequently happens that one or even both testicles do not descend into the scrotal sac. Such an animal is described as a ridgeling or rig, or when the condition is seen in pigs, the animals are commonly referred to as "stags." The testicles normally develop in the abdomen, and at or about birth they are drawn towards the inguinal

Removing the testicle.

The end of the cord after removal of the testicle. It is held by forceps to photograph it.

Showing stitches inserted in the skin wound.

canal, pass down this canal, and are located in the normal position in the scrotum. Should this normal course not be followed, one or both may be retained in the abdomen.

The castration of rigs or stags is a difficult operation, and as the stag is a most unsatisfactory animal to have on the farm, it is probably more economical to destroy this class of animal in early life. It frequently happens that an owner will remove one testicle, the other being retained. This stag animal is dangerous when placed in a pen or truck with other normal barrows and sows, and much damage through flesh wounds may be caused to the other pigs.

After-effects of Faulty Castration

When castration is carried out carelessly or under insanitary conditions, the wound becomes infected, pus forms,

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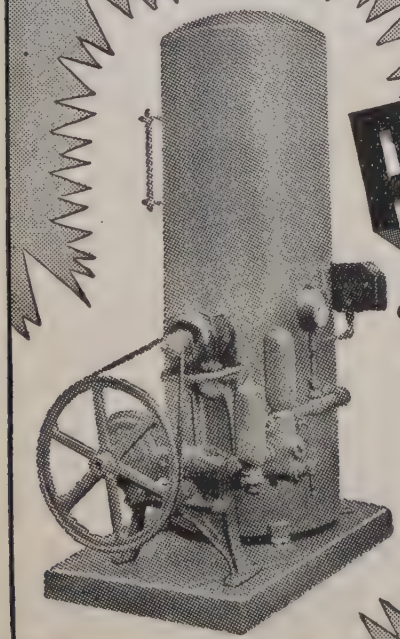

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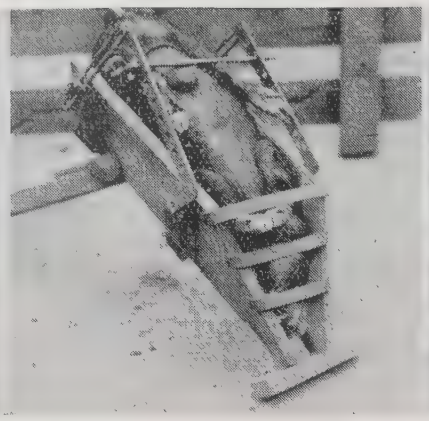
Methods of Restraint of Pigs When no Assistant is Available



On farms where an assistant is not available to aid the operator, it is not nearly so easy to carry out castration in the same careful manner. As the operator will have to handle the pigs as well as do the operation, an extra receptacle containing antiseptic solution will be required to keep the hands in a clean condition. In such cases the pig may be controlled in one of several ways—illustrated by the accompanying photographs.

and the skin may heal over the surface, leaving the pus imprisoned underneath. The abscess becomes larger and larger, and unless opened, drained, and thoroughly flushed out to allow healing to take place from the bottom, the result is an ugly, enlarged abscess which may or may not be discharging pus. The photograph on page 241 shows the scrotal abscesses in the live animal.

If it is possible to remove the abscesses at the works during inspection, serious mutilation of the ham on either side cannot be avoided. In many cases it is not possible to pass the carcass because of other secondary abscesses internally, and the carcass must be condemned and consigned to the digester. It is therefore most important to carry out castration in the best possible way, strict cleanliness being observed throughout in order to prevent the present amount of unnecessary waste.

Necrotic Ulcers Or Sores

Quite frequently one sees the castration operation site free from abscess of any size but infected with the organism, spirochaete, which gives rise to an ugly, necrotic raised sore, which is amenable to suitable treatment. On premises where the infection is likely to be found it is advisable to drain the sections thoroughly and dress liberally with lime. The use of slaked lime or chloride of lime about the feeding troughs and sties is also recommended with a view to reducing the infection on the pig premises.

Naturally, the radical treatment is to remove the pigs to a clean, fresh site, but this is not always economically possible. It should, however, be given serious consideration when the pig sections and piggeries become pig-sick through intensive stocking on small areas. Intensive pig-keeping frequently necessitates the holding and housing of pigs on concrete floors, subject to excellent drainage, and provided with an adequate water supply to maintain a high standard of hygiene in all the operations connected with the raising and fattening of pigs.

The treatment of necrotic sores on pigs consists of scrubbing the sores with a stiff brush in order to remove the dead outer layer of scab material. The sores are then dusted lightly with powdered antimony tartrate. Where this powder comes into contact with the organism, the disease is arrested and normal healing of the sore takes place. It is well to remember that the powder is very poisonous, and should not be allowed to come into contact with any feeding stuff or feeding troughs.

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Surveys have shown that there is a place for subterranean clover in North Canterbury, and this article points out that success is attainable over a wide area and describes how to avoid some, at least, of the poor results previously obtained.

Worthy of Use in North Canterbury

Introduction

By R. P. CONNELL, Fields Superintendent, Christchurch.

THE accompanying article is based partly on surveys made by Mr. Beggs on two different occasions some few years ago in respect of the subterranean clover position throughout Canterbury, the information collected in the surveys having been supplemented since by observations made by Mr. Beggs as a field officer in North Canterbury. In the surveys many farmers co-operated by devoting a good deal of time to supplying detailed information about the culture and the utilisation of subterranean clover, and the article supplies an indication that the co-operation of the farmers has been valuable. Thanks are extended to those who participated in this useful co-operation.

In a general way, the guidance provided by the article is applicable to farming under corresponding conditions throughout Canterbury and in any other districts where the conditions are parallel. The surveys have shown that in Canterbury there have been a substantial number of avoidable failures and disappointment with subterranean clover during recent years, and the article, therefore, is timely in that it indicates:—(1) that success is attainable over a wide territory, and (2) how to avoid in the future some, at least, of the poor results that have been in evidence.

There seems to be a tendency to fasten attention unduly upon the poor results without giving sufficient attention to how such results have arisen. Because many of the past poor results are looked upon as avoidable, one feels that they have influenced too much the decisions of the farming community, and that the sooner they are fully understood the sooner will subterranean clover assume the full role it can advantageously be given.

THERE are a few stands of subterranean clover in South Canterbury which have been established for 12 years or even more, but these represent the earliest sowings in the district, and it was not until four or five years ago that interest in this clover became marked. No great

By J. P. BEGGS,
Instructor in Agriculture, Rangiora.

number of sowings took place until 1937, and since then the area under subterranean clover has steadily increased until the present time. Especially during the last two or three years has the increase in sowings been rapid.

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Fig. 1.—It is very desirable to avoid as much ploughing as possible on such land as this. Subterranean clover, in providing a permanent type pasture on this type of soil, has greatly reduced cultivation costs.

Fig. 2.—A fence-line contrast on light land in the Loburn district. On the left the white clover sown has disappeared, leaving poor pasture consisting mainly of hairgrass and sweet vernal. The subterranean clover-dominant sward on the right is producing abundant, succulent herbage.

Soil Type

Soil type has naturally been a factor in the localisation, or rather the concentration, of subterranean clover growing in certain areas, and in this connection the very keen interest displayed in the growing of this clover in the Culverden and Waiau districts can be cited. In these localities a large percentage of the grassland contains subterranean clover, and excellent results are being obtained from its use. Some farmers have now reached the stage where they make a practice of including this clover in all their pasture sowings.

Subterranean clover is found growing on all types of soil from light to heavy, but it is found mainly on the light to medium classes, and it is on these soils that it is of most value. On the better land it will grow quite well in association with white and Montgomery red clovers, and some farmers prefer to use it in this way, as it produces early spring feed while the white and Montgomery clover come away later and continue growth into the summer after the subterranean clover has died off.

It is found that under North Canterbury conditions on such land these three clovers will continue to grow in association without any one type flourishing to the detriment of the others. On the light land, however, it is usually found that subterranean clover, when sown in mixtures with white and red clovers, will gradually gain command, until after several seasons it is the dominant, if not the sole, clover left in the sward.

Seasonal Conditions

Rainfall and general climatic conditions exert an important influence on subterranean clover growth. Of course, this can be said of all pasture species, but in the case of subterranean clover the effects of adverse seasonal conditions are more far-reaching than is the case with most pasture plants, as this clover is an annual, depending on its reseeding powers for continued existence in the sward.

Adverse weather conditions are most detrimental in the first season, as it is found that a well-established stand exhibits amazing powers of recovery after a severe set-back such as may result from grass grub attack or a poor reseeding. This power of recovery is due to the large amount of seed lying dormant in the soil from previous reseedings. Well-established and dense stands have been known to survive two successive severe grass grub attacks and still provide a good cover. A poor reseeding in the first year, however, will present a severe

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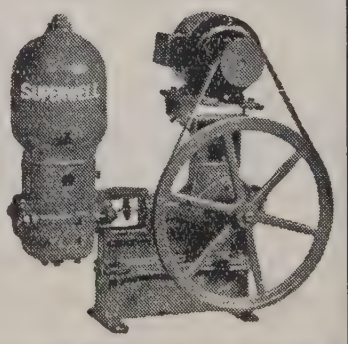

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Fig. 3.—A closer view of the clover illustrated in Fig. 2. This paddock has provided excellent grazing for ewes and lambs. Regular topdressing has been an important factor in the success of this stand.

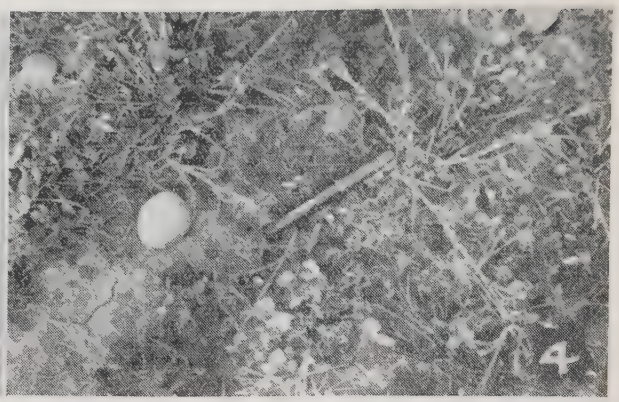

Fig. 4.—The form of growth of a Mount Barker plant at flowering time. Note the more lax appearance than that exhibited by the Tallarook strain in Fig. 5.

set-back to the stand, as there is no reserve of seed to call upon, with the result that the growth of clover the following season will probably be patchy.

Ideal conditions for subterranean clover growth are found to be early and abundant autumn rains and a fairly mild winter, followed by a moist summer. Such a season allows of a long growth period. Should the autumn rains be late and followed closely by frosts, the young plants do not obtain a good establishment and abundant root development in readiness for instant and rapid growth at the onset of the spring rains.

It is in the seedling stage that the clover is vulnerable to frost injury. Once the plant has established itself and obtained a good root-hold, it will withstand many degrees of frost without suffering any harmful effects.

The season just past (1941) has been very suitable for subterranean clover. Although rain did not come until late in the autumn, the frosts were also late, and growth was maintained until late in the winter. The plants were thus well established and enabled to

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make excellent growth when the bountiful spring rains set in.

Utilisation of Sub. Clover

Practically all stands of subterranean clover in North Canterbury are used mainly for sheep grazing. Many farmers have found that through the use of this clover they have been enabled to clear their fat lambs earlier and in excellent condition. All growers are agreed that lambs thrive particularly well on this type of pasture, and on many farms rape areas have been considerably reduced as a result of the sowing of subterranean clover.

Hay crops are occasionally taken from subterranean clover stands, and the quality of this type of hay is good.

Strains of Sub. Clover

Practically all sowings of subterranean clover in North Canterbury have been made with the Mt. Barker strain, but a few farmers have sown Tallarook, and a comparison between these two strains is interesting.

The Mt. Barker is the earlier strain of the two, and because of this disparity in the growth periods, it is often advantageous to have areas of both strains on the one farm. The Mt. Barker area will come away slightly earlier in the spring, and the Tallarook will continue to produce feed for a time after the former strain has flowered and died off.

The Tallarook strain is not nearly so well known as the Mt. Barker, but it is felt that the former strain will become increasingly popular in the future. It would appear that the two strains are very similar in total seasonal production under North Canterbury conditions, but there are marked differences in growth form and reseeding capacity which are worthy of note. The Tallarook strain produces a denser growth about the crown than the Mt. Barker, the latter presenting a more lax appearance generally. This characteristic of Tallarook enables it to maintain a better ground coverage under hard grazing conditions than the Mt. Barker strain. Further, the former is a much more prolific seeder, another point in its favour under heavy stocking and close grazing conditions. It should not be inferred, however, that the Mt. Barker strain is easily grazed out of the sward, but rather that, under very heavy stocking, Tallarook will maintain a denser cover than Mt. Barker.

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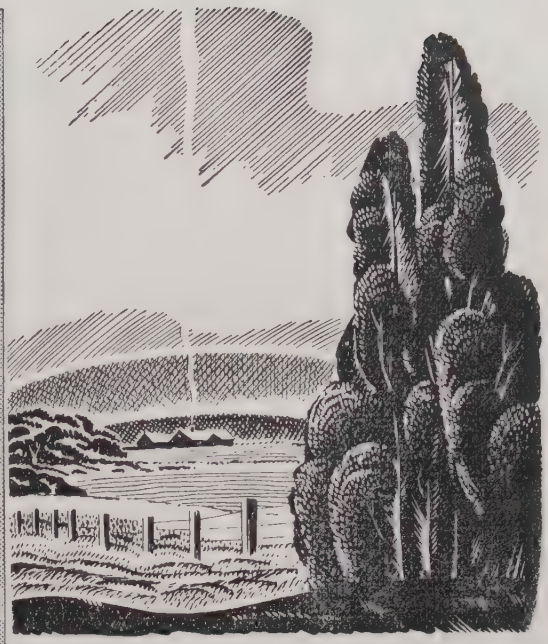

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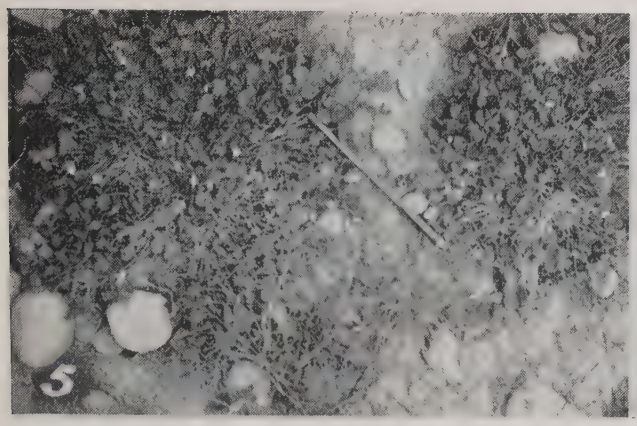

Fig. 5.—The Tallarook strain has a denser growth about the crown than the Mount Barker (compare with Fig. 4.).

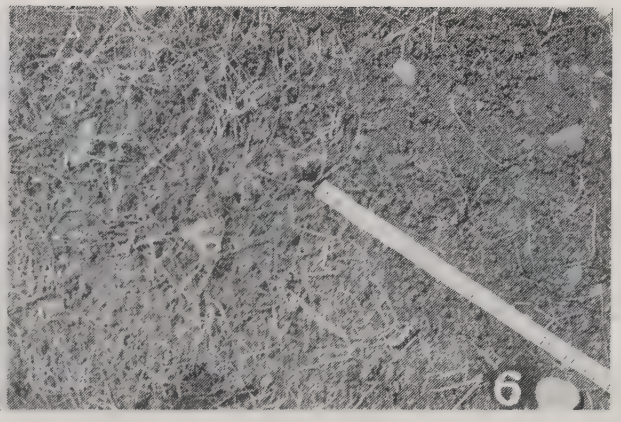

Fig. 6.—The Tallarook strain of subterranean clover is a very prolific seeder. This photograph shows the mass of burrs on the bare ground following a severe grass grub and porina attack. This seed germinates and produces a good sward without any treatment.

Establishment of Sub. Clover

Various methods of sowing down are adopted. In many instances, the clover is sown at the rate of from 2 lb. to 4 lb. in grass seed mixtures without an accompanying crop, and this must be considered the best method of securing a good establishment of all the species concerned. Many farmers, however, prefer to sow down with a crop in order that their cultivation costs may be reduced, and under the stress of ever-increasing labour difficulties this practice will probably become more common.

Oats, rape, and turnips are the crops most frequently used. When this method is adopted, however, maximum returns cannot be expected from both crops. Sometimes the annual crop will thrive to the detriment of the pasture mixture, and sometimes vice versa, while at other times indifferent results may be obtained from both. While the fact remains that pasture is frequently sown down in this way, it may be well to advance methods whereby the chances of the subterranean clover establishment proving successful are enhanced.

If sown with oats, the clover seed must be broadcast to avoid covering it too deeply. Further, a heavy seeding of oats will have too much of a smothering effect on the clover plants.

With rape as the associate crop, there is often the danger of sowing the subterranean clover at the wrong time. The natural time for sowing the clover is in the autumn, and spring sowing often leads to flowering in the autumn, with the result that the seed is not matured before the winter. The plants will then die off, leaving bare patches over the winter and no seed for next season's crop. Most October and many November sowings are affected in this way, but December and January seedings are suitable. During the grazing of the rape the clover and other pasture species will suffer injury through trampling by stock, the severity of the damage depending on the nature of the stocking. However, provided the grazing is reasonable, and granting the clover a good spell for reseeding in the late spring and summer, quite good stands may be established by sowing with rape.

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As turnips are sown mainly in December and early January, the time of sowing with this crop is safer than with early rape. The stock damage, however, is liable to be greater than in the case of sowings with rape because of the greater concentration of stock and the time of grazing. Turnips are fed off mainly in the winter months when the ground is wet, and it is obvious that under such conditions damage to pasture plants will be much greater than under dry conditions. It is found that the recovery of the damaged plants is more rapid when the crop is grazed off in breaks which are closed to stock as soon as the grazing is completed—that is, the break fence should not merely be shifted on and the stock allowed the run of the grazed area until the whole paddock is fed off.

The surface fertility engendered by the feeding off of rape and turnips results in the production of strong and vigorous subterranean clover plants in the spring, and, provided grazing damage has not been severe, the individual plants will cover large patches with their long runners.

Drilling v. Broadcasting

Broadcasting gives a better and more even distribution of seed with a better ground cover in the early stages of growth, and where moisture conditions are satisfactory, this method is recommended; but where there is danger of dry conditions interfering with establishment, drilling is advisable. When drilling, care should be taken to avoid burying the seed too deeply. The gaps between the drills will be largely filled in the second season provided a good reseeding was obtained in the first summer. The old rule of the fine and firm seed bed applies here as for all other small seeds, and good consolidation will facilitate shallow drilling.

Surface sowing is seldom practised in North Canterbury, and conditions do not favour this method as greatly as in the North Island. However, some small areas have been successfully established in this way, and, although surface sowing is not recommended for ploughable land, the method is useful for unploughable areas, such as gullies and steep faces. Establishment under these conditions is naturally much slower than on ploughed land.

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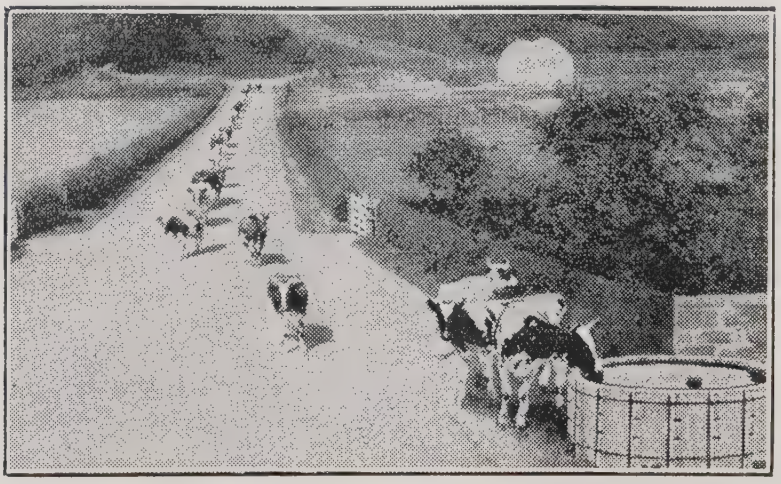

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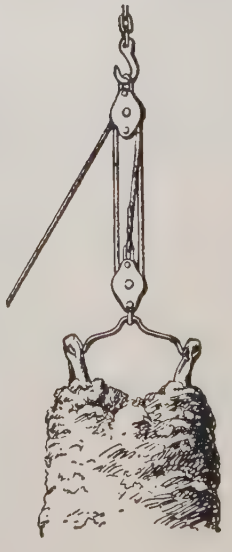

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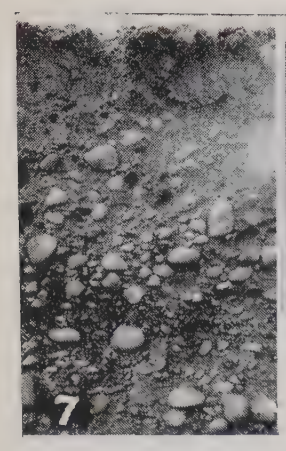

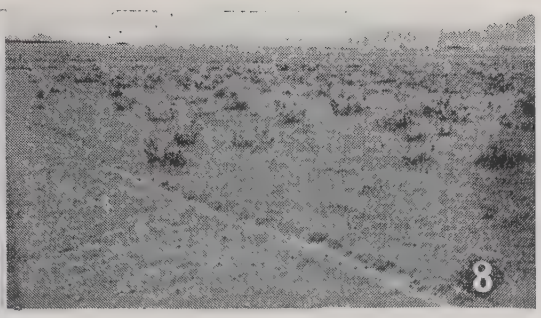

Fig. 7.—A profile of land where subterranean clover has given good results in the Culverden district. *Fig. 8.*—The type of land depicted is typical of a considerable area of light land in the Culverden-Rotherham districts. Subterranean clover could profitably be used to a greater extent in this locality.

The importance of this first reseeding cannot be over-emphasised, as, once a good cover of clover has been obtained (and this stage can well be reached in the second year), no further special treatment during reseeding need be given in future years. Even under very close grazing the plants will set seed close to the crowns.

To obtain the best results it is advisable to have paddocks as small as is practicable in order that they may be heavily stocked at intervals and then spelled till growth comes away again.

Topdressing

It is now a well-established fact that topdressing should accompany

Time of Sowing

As stated, the natural time for the sowing of subterranean clover is the autumn, and the disadvantage of spring sowing was also dealt with. Late sowing should similarly be avoided. If a successful establishment of clover is to be obtained, it is imperative that the young plants should obtain a good root-hold before the frosts set in, as it is only in the early stages that subterranean clover plants are susceptible to frost injury.

Suitable months for sowing, depending on moisture conditions, are December, January, February, and March. In the colder regions sowing before March is preferable.

Management of Sub. Clover Areas

Once a good, even strike and establishment of plants is obtained in the first year, the initial hurdle has been overcome, but all this work is wasted if it is not followed up by the correct treatment.

The most important consideration in the first season is to obtain a good reseeding, and for this reason it is imperative that the stand should be spelled in the late spring and early summer when the plants are sending out runners and forming seed. If the land is heavily stocked at this time, all the advantages of a good strike will be lost, as the runners of many plants will be grazed off, with the result that, instead of obtaining an even and abundant distribution of seed over the whole area, there will be many patches left bare. This is the explanation of the patchy nature of many subterranean clover areas. It takes many years for such patches to fill out.

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any subterranean clover sowing programme. This clover responds particularly well to the application of phosphatic fertilisers, without which it is a great deal less productive. The introduction of subterranean clover into the sward can make topdressing payable where previously it was uneconomic.

Under present conditions normal topdressing programmes cannot be carried out, but under normal conditions it is recommended that a small dressing of superphosphate (1 cwt. or 1 bag per acre is suitable under North Canterbury conditions) be applied annually rather than a heavier application at longer intervals. Topdressing should be carried out in the autumn to give the young plants a good start before the winter sets in.

In general, the response to lime is not as marked as that to superphosphate, but in most parts of North Canterbury it is necessary to apply lime in order to get the full benefit of a phosphatic dressing. Farmers can well be guided in this respect by the lime response in their ordinary pastures.

Treatment of Old Stands

It is usual to find that when subterranean clover is sown on light land in a grass seed mixture the grass will practically disappear after two or three years and that a clover-dominant sward will result. In spite of this, it is preferable to sow ryegrass in the mixture, as it aids in protecting the young clover plants against frost lift, besides being a useful ingredient of the sward for two years or more. It will be found that after another year or two following its disappearance the ryegrass will gradually start to make its appearance in the sward again. This is due to the fact that the clover has in the meantime built up the nitrogen-content of the soil to the stage where continued ryegrass growth is possible. Thereafter, the ryegrass-content will increase until a well-balanced pasture is produced. This return process of the ryegrass, however, will be fairly slow, and the same results can be obtained much more quickly by cultivating the stand, say after four or five years, and broadcasting the grass. This operation may best be carried out in the autumn before the germination of the subterranean clover seed.

If desired, the paddock may be ploughed and a crop of turnips or

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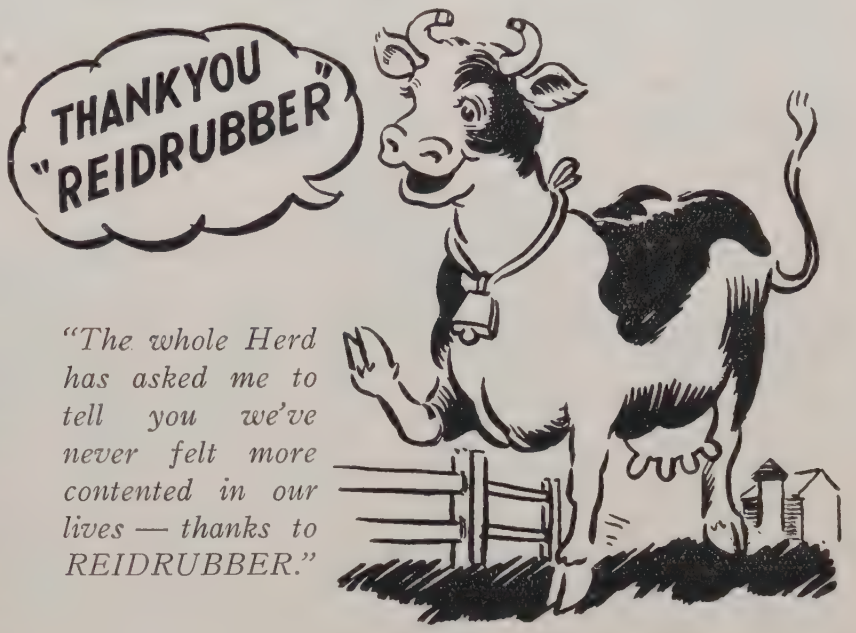

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rape taken, following which the grass may be introduced. If the paddock is deep ploughed, not much clover will appear in the crop, but on ploughing again the seed is brought back to the surface, when it will germinate and come away with the grass. If the seed is not left buried deeply when the crop is sown the clover will appear in the crop and may be fed off with it. Quite vigorous and dense stands of subterranean clover may be produced in this way without any re-introduction of clover following the taking of a crop.

Summary and Conclusions

(1) Subterranean clover builds up the fertility of light land to the stage where it will support continued ryegrass growth, and in North Canterbury it is proving its worth on such light and on medium class land.

(2) It should be remembered that under suitable soil and climatic conditions white and red clovers are of higher production than subterranean clover. The latter must not be regarded as a **substitute** for either white or red clover, but rather as **another** clover which may be used to enhance the productivity of light to medium class land.

(3) Seasonal climatic conditions, especially in respect of the time and extent of the autumn rains, exert an important influence on the productive capacity of subterranean clover, but it has proved its ability to survive bad seasons and thus to provide a permanent type sward.

(4) The main strain used in North Canterbury has been the Mt. Barker, but Tallarook has been tried also and is likely to increase in popularity.

(5) The best method of establishing the clover is by sowing in a grass seed mixture apart from a crop. Often, however, the taking of a crop is associated with the sowing of the pasture, and satisfactory establishments may be obtained in this way provided the correct treatment is given.

(6) Drilling and broadcasting are both suitable under certain conditions. Surface sowing is not generally applicable, but is useful in some circumstances.

(7) Suitable months for sowing are from December to March, both months inclusive, but earlier than March seeding is preferable.

(8) The clover is susceptible to frost injury only in the early stage of growth before a good root-hold is established.

(9) Management is of paramount importance in the successful establishment and maximum utilisation of subterranean clover stands. Three points worthy of special mention are:—(a) Ample spell for reseeding in first year; (b) suitable topdressing; (c) grazing management. Small paddocks will allow maximum utilisation in making possible a system of alternate grazing and spelling.

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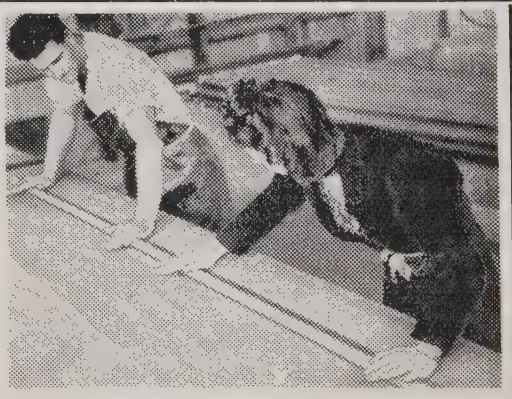

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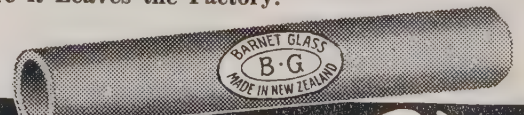

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WAIMATE WEST DEMONSTRATION FARM

Reorganisation To Meet Wartime Needs

By J. E. DAVIES, Instructor in Agriculture, Hawera.

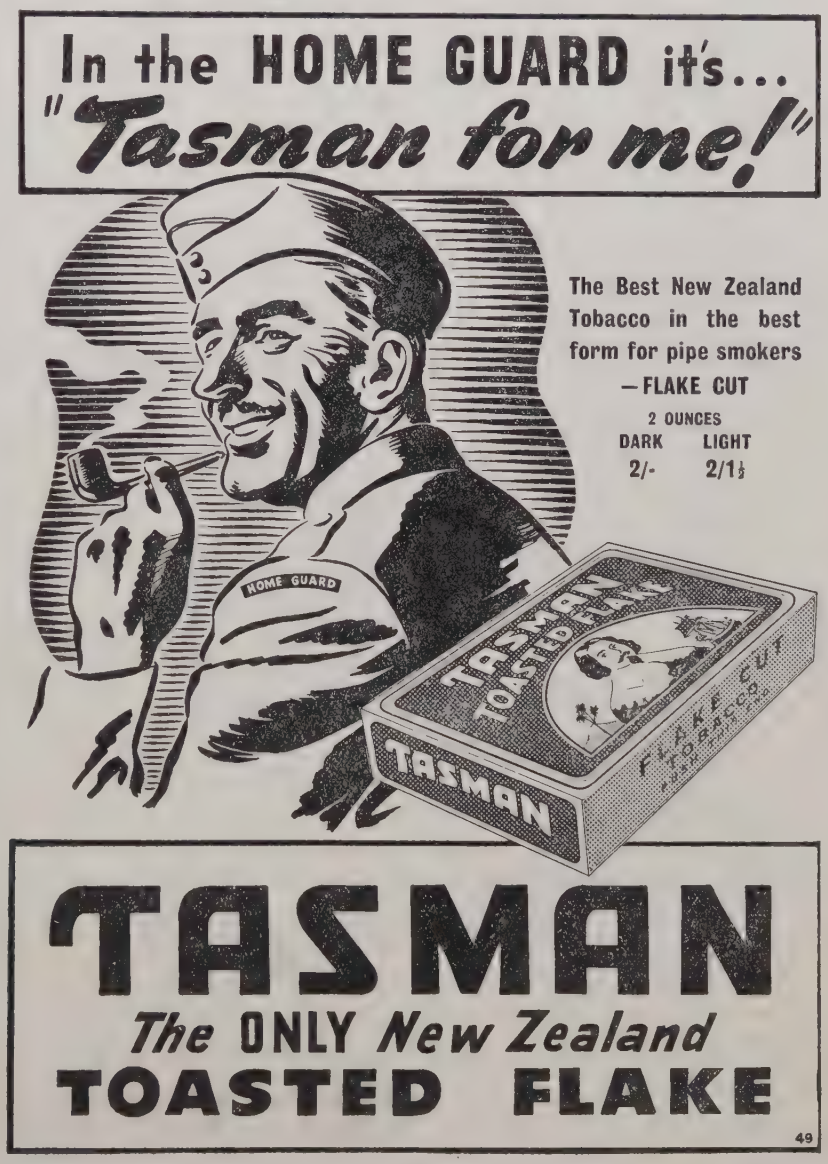
AS with other farms, the war has created new problems for the Waimate West Demonstration Farm. A description of the farm itself, its establishment, development, and control, together with a review of the pre-war activities, appeared in the "Journal of Agriculture" for January, 1939. This article gives details of the production capacity of the farm up to and including the 1937-38 season, and briefly reviews farming operations for the past three years, taking particular note of the efforts made to meet wartime demands.

Although special experimental work intended to continue over several seasons had already started, the farm committee decided on the outbreak of war to concentrate on the increased production of milk for cheese and of pig-meat. Existing experimental work which was calculated to interfere with these aims was therefore cancelled. Adjustments were made to the farm layout to provide for strict rotational grazing, a scheme of topdressing the pastures twice a year designed to fit in with the grazing management was adopted, and an improvement in the herd was provided for. In the pig section the policy of growing an area of sugar beet for the wintering of up to 30 grown stores intended for fattening to baconers by October and November was continued, and adjustments were made in the farrowing times of the sows to suit this programme.

A full report of the original trials with sugar beet on the Waimate West Demonstration Farm was given in the August, 1940, "Journal," and it can be stated that the main factor in the very satisfactory increase in returns from pigs is due to the provision each season of an acre of this very valuable crop.

The most forceful method of showing the results of the policy adopted by the committee is to allow the production and financial figures to speak for themselves. The accompanying

A sample of the sugar beet, the crop which put the profit into pig-keeping on the farm. From March to September the sugar beet supplies the bulk of the feed when whey supplies are lowest.



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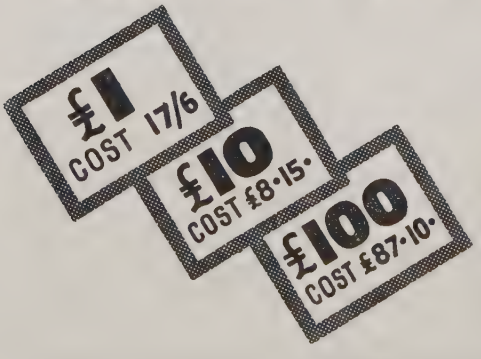

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The concrete race through the centre of the farm. A chain or two was added each year at no great expense, and the cows now come into the shed with legs and udders clean throughout the year.

The 2½ acres of grassland for pigs, which, with whey and sugar beet plus £35 for meals, gave a gross return of £220 17s. 6d. last year. Whey feeding can be made to pay.

table gives a summary of the returns for the period over which the writer has served as chairman of the Farm Committee.

FINANCIAL RETURNS FROM 1935 to 1941.

Year.	Bank Overdraft (—). Credit (+).	Butterfat Revenue.	Pig Revenue.	Working Account Expenditure.	Expenditure Fertiliser and Lime.	Farm Assets.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1935 ..	—1,253 14 6	720 10 2	55 10 4	657 0 11	62 1 0	3,097 15 7
1936 ..	—985 8 7	787 2 1	81 2 1	567 11 7	15 6 6	3,163 1 6
1937 ..	—430 12 1	1,285 4 4	72 3 10	708 5 4	40 3 7	3,241 4 11
1938 ..	—72 4 10	1,354 10 5	152 17 2	920 18 6	82 11 11	3,405 15 7
1939 ..	+49 18 6	1,485 6 8	165 14 3	1,011 12 4	130 9 6	3,855 15 9
1940 ..	—125 0 4	1,574 5 10	216 6 1	1,116 18 4	101 9 0	4,081 17 2
1941 ..	+438 4 3	1,773 1 11	220 17 6	1,169 5 2	70 9 7	4,480 4 10

Note: The figures for expenditure on lime and fertiliser are not exactly those for any one twelve-month period, as payments for fertiliser actually used in one year may appear on the accounts for the next season. The figures do show, however, that the expenditure on the 90 acres for the last three years averaged £100, compared with an average of £250 for the previous four years.

Satisfactory Results

The returns indicate the jump in production both of butterfat and of

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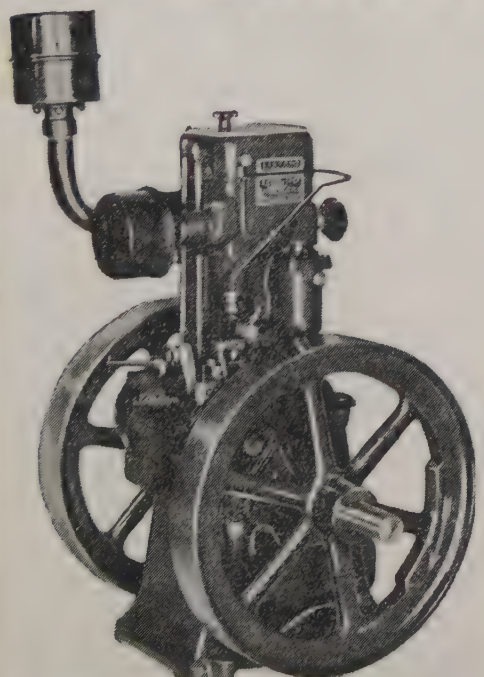

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pig-meat which has resulted from the dropping of experimental work for the time being and concentration on the purely productive aspect of the farm activities. While substantial progress was being made before the war, the adoption of twice-a-year topdressing and the better utilisation of pasture growth made possible with the more straightforward programme of grazing management which could be adopted when there were no special trials to consider have resulted in a most substantial increase in butterfat and pig-meat production over the past three seasons.

The actual factory returns of butterfat from the full 90 acres for the past three seasons is shown in the following table:—

Season.	Butterfat Production (lb.)
1938-39	19,882.3
1939-40	22,341.3
1940-41	24,315.1

Difficulties Overcome

Apart from the adjustments necessitated by a change-over from experimental work to a full production programme, adequate labour in recent seasons has presented a problem. The services of the two permanent hands employed (in addition to the manager) were lost soon after the outbreak of war, and could not be satisfactorily replaced. The work of the farm has therefore been undertaken as a war effort by the manager, his daughter, and a young son just left school. Additional help is employed only at harvesting. The determination of the manager and his family to get results and to overcome difficulties has been a big factor in the improved production shown.

Profits for War Effort

In keeping with the policy of increasing production as a war effort, the committee has decided that all profits will be devoted to the war effort. Substantial donations, which will be continued, have been made to patriotic funds, and in addition a National Savings account has been provided for.

Stock Feed

It is of interest to note that, with the exception of the area of sugar beet grown for the pigs, no crops are used. The herd is fed entirely on grass, some thirty acres of the pastures being closed in the late spring and cut for hay and silage. As the herd comes into profit in July and August, the milkers have a spell of two to three hours each day on winter grass in paddocks closed in April and May. About 24 acres are shut up each season from mid-April to the end of May, when most of the herd is dry. This area rationed to the milkers, which get in addition a feed of ensilage in the day and hay at night, lasts until the end of August, when paddocks closed in early July and specially topdressed are ready to

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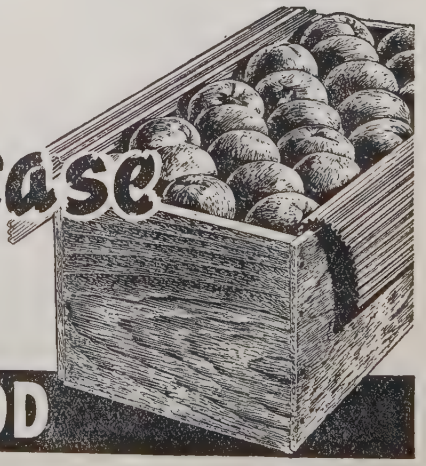

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carry them on. There is no doubt that this autumn-saved grass has played an important part in getting increased production.

Pig Production

Through the introduction and use of sugar beet the pig has become "the gentleman that pays the rent" on the Manaia Demonstration Farm. The increased returns from pigs has been obtained with no additional expenditure in meals. Meat-meal and barley-meal are both used, the former in the autumn and winter as a supplement to sugar beet for young pigs, and the latter in the spring and summer as a supplement to whey. also for the younger pigs. The policy has been followed of using concentrates in the form of meals for pushing along the growth of young pigs, and of feeding to capacity the more bulky whey and sugar beet to the older pigs, when they can use this type of food to best advantage. During the past three seasons, when the gross returns from pigs have been £165, £216, and £220 respectively, the maximum expenditure on meals for pigs, calves, and poultry has been £45, the average being less than £40, of which less than £30 has been spent on the pigs.

Fertiliser Costs

The amount spent on fertilisers and lime over the past seven years shows an average of less than 16s per acre for both fertiliser and lime delivered on the farm. The experience of the past three seasons, when the amount spent on fertiliser and lime was increased from an average of £50 for the 90 acres to £100 a year, has shown that the additional expenditure was well worth while provided the pasture growth was fully utilised.

The increase in butterfat of 6000 lb. for the two seasons since the additional manure was provided shows a remarkable return for the investment of an additional £50 a year. It was the intention of the committee to increase still further the manuring programme, as it was obvious that there was plenty of scope for still higher returns.

However, the rationing of fertiliser has set a new problem, which is being confidently met by (1) an intensification of harrowing to keep animal droppings well spread, thus feeding back to the pastures a large proportion of the minerals removed by grazing; (2) a further concentration on efficient use of the grass produced on the farm; and (3) still more drastic elimination of the low producer in the herd. By paying particular attention to these three points, and at the same time seeing that the pastures are prevented from running away to seed in the early summer, it is confidently expected that a satisfactory standard of production can be maintained despite the severe reduction in the amount of fertiliser available.

Acknowledgment is made of the continued keen interest and practical help of the committee, together with the efficient services of the farm secretary, Mr. V. H. Hobday, and of the farm manager, Mr. A. S. Patterson, who for the past 20 years has carried out the policy of the committee with considerable success.

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Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the ten months, May, 1941, to February, 1942, have been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat-export Slaughterhouses—						
Auckland	132,078	576,358	199,701	80,613	1,281,686	310,830
Poverty Bay-Hawke's Bay	44,097	53,178	466,567	242,028	1,393,698	24,206
Taranaki Manawatu	57,807	216,688	251,014	163,581	1,240,413	130,204
Wairarapa-Wellington	32,704	25,799	279,423	154,597	909,993	27,776
Totals	266,686	872,023	1,196,705	640,819	4,825,790	493,016
Abattoirs	98,064	31,553	424,835	208,154	81,128	105,014
North Island Totals	364,750	903,576	1,621,540	848,973	4,906,918	598,030
South Island						
Meat-export Slaughterhouses—						
Nelson-Marlborough	730	11,095	24,314	10,071	180,411	9,714
Canterbury	8,835	39,052	385,063	332,464	1,677,921	31,149
Otago-Southland	4,589	42,124	224,486	204,879	1,877,181	5,847
Totals	14,154	92,272	633,863	547,414	3,735,513	46,710
Abattoirs	45,015	11,095	225,255	121,142	44,274	36,490
South Island Totals	59,169	103,367	859,118	668,556	3,779,787	83,200
Dominion						
Meat-expt. Slaughterhouses	280,840	964,295	1,830,568	1,188,233	8,561,303	539,726
Abattoirs	143,079	42,648	650,090	329,296	125,402	141,504
Grand Totals	423,919	1,006,943	2,480,658	1,517,529	8,686,705	681,230
Same Period, 1940-41— Meat Export Slaughterhouses and Abattoirs	489,923	1,038,212	2,642,138	1,789,258	8,367,571	645,443
Same Period, 1939-40— Meat Export Slaughterhouses and Abattoirs	407,145	1,027,998	2,477,657	1,348,247	7,418,803	529,920

Slaughterings of Pigs

The 115,726 pigs slaughtered in meat-export slaughterhouses and abattoirs during the month of February, 1942, were distributed in weight ranges approximately as follows:—

Up to 60 lb.	943
61-110 lb.	43,846
111-120 lb.	12,827
121-160 lb.	45,734
161-180 lb.	5,880
Over 180 lb.	3,068
Sundries	3,428

The grading of porkers was 91 per cent. of 1st quality and 9 per cent. of 2nd quality, and the grading of baconers was 74 per cent. of prime 1's, 20 per cent. of prime 2's and 6 per cent. of second quality.

In the different weight ranges of baconers the grading is as follows:—

111-120 lbs.	80%, 17%, 3% of P1, P2 and 2nds respectively.
121-160 lbs.	73%, 21%, 6% of P1, P2 and 2nds respectively.
161-180 lbs.	68%, 24%, 8% of P1, P2 and 2nds respectively.

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Alternate dosing is recommended between COOPER'S N.C.A. (Nicotine, Copper-Sulphate), and COOPER'S WORM DRENCH. (Both Registered pursuant to Stock Remedies Act, 1934).

Cooper's N.C.A. now contains Cobalt.

Obtainable from Merchants and Stores.

COOPER, McDOUGALL & ROBERTSON
(N.Z.) LTD.
CUSTOMS STREET EAST, AUCKLAND, C.1.

NEW
PHENOTHIAZINE DRENCH
Limited quantities available at LOWEST PRICES. For particulars apply to above address.

CARBON TETRACHLORIDE

Cooper's WORM DRENCH

Dosing is often as important as dipping!

Veterinary Notes for the Farmer

Blindness in Sheep (Ophthalmia)

Contributed by the
LIVESTOCK DIVISION

OUTBREAKS of blindness in sheep are seen from time to time, due to the formation of a grey film on the anterior surface of the eyeball. The disease may occur at any time of the year, but probably it is most frequently seen during the autumn months.

Although dust from the roads or some other form of irritation of the eyes is probably the exciting cause of the trouble, it has been shown experimentally that the infection may be spread from an affected eye to the eye of a sound sheep through the medium of the infected eye discharge. The disease may therefore spread rapidly through a flock unless suitable control measures are taken to deal with the original cases. Probably, flies are a factor in the spread of the infection from the affected to the healthy sheep.

In the first place, it is necessary to examine all the sheep carefully in the affected paddock. All those showing any symptoms, even in the early stages, should be segregated and removed from the non-affected sheep to a suitable level paddock for treatment. The symptoms to be looked for are discharge from the eyes, a reddening of the lining membranes of the eye known as conjunctivitis, and the various stages of film formation on the anterior surface of the eyeball.

Any sheep showing these symptoms should be segregated and isolated from the sound, healthy sheep. A level paddock free from logs and drains will be most suitable in order to prevent losses from further injuries when dealing with partially or totally blind animals.

The treatment of affected sheep consists of instilling into the eyes a few drops of a suitable eye lotion. The sheep's head should be held to one side and a few drops of the selected lotion placed on the surface of the eyeball. If only a small number are to be treated, an eye dropper or fountain pen filler may suit the purpose. If, however, a large number are affected, a small clean oil-can will be found very serviceable. Treatment of the affected eyes should be carried out daily until the film clears up and the inflammation leaves the membranes of the eye.

A suitable lotion for the eyes of sheep may be prepared by your chemist through the use of six grains of sulphate of zinc to 1oz. of distilled water. At the same strength, an eye lotion of nitrate of silver may be preferred by some owners. A 10 per cent. solution of Argyrol will also be found very beneficial for treating the affected eyes.

Occasionally, calves are found affected, in which case the same treatment will be found to give satisfactory results.

Ringworm in Cattle

ONE of the skin diseases frequently encountered among our domestic animals is that known as ringworm. Although the disease may attack man or any of the domestic animals, it is most commonly seen among cattle, the condition being most prevalent among young stock, such as calves and yearlings, and in cattle in poor condition.

Ringworm is a contagious disease. Animals become infected by direct contact with others suffering from the disease or indirectly from contaminated shelters, bedding, or posts against which infected animals have rubbed themselves. The spread among animals is gradual, but it is much more rapid if a number are confined in a single pen.

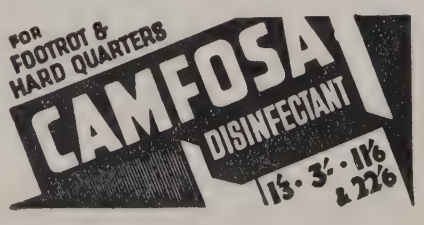
In affected animals patches of various sizes may make their appearance on any part of the skin. The most common area for the lesions to develop is on the skin around the eyes and ears, and similar patches are frequently seen on the skin of the neck. The surface of the skin on these patches is greyish in colour, and presents a dry, scaly appearance.

The cause of ringworm is a variety of fungi which lodges round the hair roots, the hairs becoming brittle and breaking off. The irritation brought about by this parasite produces a thickened and wrinkled condition of the skin and affected areas.

JERMOL HELPS TO INCREASE FERTILITY AND REDUCE STERILITY LOSSES!

Science's newest discovery, rich in Vitamin E, helps overcome sterility and ensures normal breeding. Countless laboratory experiments prove that when apparently sterile animals are fed a substance rich in Vitamin E such as wheat germ oil, normal breeding is assisted and losses reduced. The wheat germ oil of highest potency and purity is Jermol. For successful breeding of cattle, horses, sheep, pigs and poultry, use Jermol.

Obtainable from all stock agents or from the sole N.Z. manufacturers: D. H. BROWN & SON LTD., Moorhouse Avenue, Christchurch, C.I.



THREE EFFICIENT DRENCHES

You save money by drenching, but you save most when you use the right kind of drenches. These three Premier Drenches are proved and tested. They can be used effectively singly, to eradicate specific parasites, or in combination, two drenches being used alternately to give maximum control over a wider variety of worms.

GIESEN'S **(Tetrachlorethylene Base).** For stomach, blood-sucking and intestinal worms. Costs only ¼d. to ½d. per dose.

SUTTON'S **(Nicotine and Bluestone with Cobalt added).** For intestinal and tape worms. Costs only ⅜d. to ¾d. per dose.

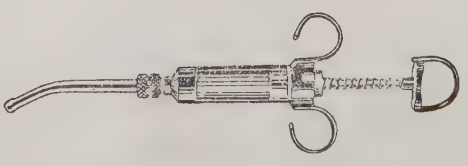
KARTET **(Carbon Tetrachloride).** For liver fluke, blood-sucking and intestinal worms. Costs only ⅛d. to ⅓d. per dose.

GIESENS · SUTTONS · KARTET
SHEEP DRENCHES

. . . and the Efficient Way of Administering them

ELLIOTT'S SEMI-AUTOMATIC DOSING SYRINGE—
Dose range 2½ c.c. to 10 c.c. Recommended for GIESEN'S and KARTET Drenches.

22/6 as illustrated



AGENTS EVERYWHERE. Without obligation write to us for further information and where to purchase your supplies, or order through your stock firm or merchant.

PREMIER PRODUCTS LTD. HUDDART PARKER BLDG. WELLINGTON

Many remedies are used in the treatment of ringworm, but before any of these are applied the skin should be thoroughly washed with warm water, soap, and washing soda, and the scabs scraped off. This is done with the object of allowing the dressing to come in contact with the causal organism. After removal of the scabs each patch should be dressed with tincture of iodine, applied with a stiff brush, making sure that every patch is thoroughly dressed; the treatment should be repeated twice further at intervals of five days.

Immediately after handling animals affected with ringworm or dressing the skin the attendant should thoroughly wash and disinfect his hands, being careful that he does not touch any other part of his skin before this has been done; if this precaution is not carried out there is a considerable risk that he may contract the disease.

Weights on Milking Cups.

F.S. (PAPAKURA):—

Could you please advise me about using weights on the cups during the milking of tough cows or long milkers. I have been advised that this method ruins the udders, but I have used this method for many years now and know many others who do the same, and I have had no trouble. I might state that the cups are changed while still warm.

When I first came to this position nearly half the herd of 40 cows were suffering severely from black pox—and thank you for the advice from your "Journal"—which we cleared most cases in about five weeks, using the 3 per cent. solution of salycylic acid in glycerine.

ANIMAL RESEARCH DIVISION:—

The practice of using weights on the cups towards the end of milking is fairly common, especially in herds where stripping has been abandoned. There is no doubt that in some cows this causes milk to flow again after it has stopped. Providing the weights are not too heavy, they do not appear to cause any injury to the udder, but it is doubtful if the practice has much to commend it where stripping is being practised.

Husk or Hoose in Calves

THE symptoms of coughing in calves at this time of the year is almost always characteristic of the condition known as husk or hoose, or sometimes lungworm disease. In calves the coughing gradually becomes more marked towards the end of summer and during the autumn and early winter months. If the calves have been grazing on low-lying pastures or the season is a rainy one, many calves will show coughing symptoms.

The well-developed cough is characteristic of worms in the bronchial tubes and lungs. The affected animals stand with the head outstretched, and during the attack of coughing the tongue frequently protrudes from the mouth. The coughing is due to the irritation set up by the worms in the lung tubes, and is really an attempt to dislodge the irritating offenders.

A species of small, thread-like worm is the cause of the trouble. Calf paddocks are liable to harbour the parasite, so that a change of paddock is one of the first essentials in treatment. Although many well-fed calves overcome the worm trouble through a change of pasture and some supplementary feeding, there is a danger of a severe check in growth or even deaths if affected calves are neglected. A form of parasitic broncho-pneumonia may set in, which frequently proves fatal.

The treatment of husk or lungworm in calves is not always easy, especially in badly-infested calves in poor condition. Many and varied treatments have been tried from time to time, including fumigation and inhalation of medicine. Drenches containing active worm medicine have been given, and injections into the wind-pipe are sometimes given. It is a fatal mistake to depend upon medicinal treatment in badly-infested calves. The location of the worms makes it difficult to attack them in such a way as to cause their death and expulsion.

In the first place, the animal's strength must be maintained and any loss of condition must be built up. Good feeding is therefore the first essential. The affected animals must be prevented from picking up more worms from the pastures and watering places, and a change of pasture to a dry, well-drained area is essential. Supplementary feeding on ensilage, hay, or even crushed oats and linseed may be necessary for very weak ani-

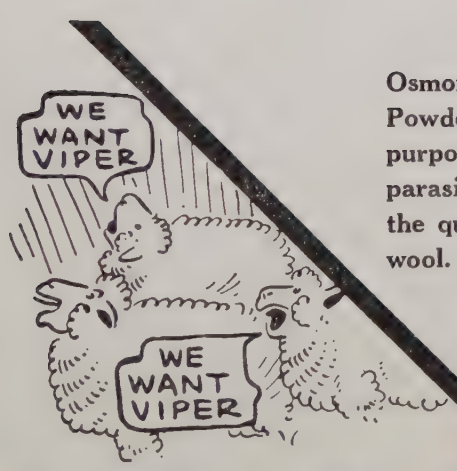
Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

A REAL

QUICK KILLER

OF PARASITES AND THEIR EGGS



Osmond's Viper Rapid Result Powder Dip is for all general purposes. It destroys all sheep parasites and helps to improve the quality and growth of the wool.

OSMOND & SON (N.Z.) Ltd.
P.O. BOX 460, WELLINGTON.

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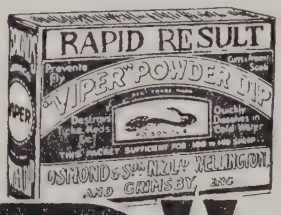
Hamilton—23 Victoria Street. Telephone 3745
Hawera—Union Street. Telephone 2717
Palmerston North—Cuba Street. Telephone 6028
Christchurch—26 Queen's Ave., Fendalton. Telephone 24-739



OSMOND'S

"VIPER"

RAPID RESULT POWDER SHEEP DIP

mals. Drenching with any of the recognised worm medicines should be resorted to in order to reduce the worms in the alimentary canal. In this way, the general health of the animal is built up to the stage where it is enabled to throw off the effects of the lungworm.

Many owners try the inhalation of ether or chloroform vapour in addition to drenching, but the underlying principle of successful treatment must include good feeding and management of the affected or susceptible animals.

EARTAGS,
Sheep and Cattle, stamped with initials, date and numbers.

EARMARKS,
Sheep and Cattle, made to any design required.

BRANDS,
Burning and Fleece.

RAM CLAMPS.

FREE TO FARMERS
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TATTOO OUTFITS,
As adopted by Breeders' Associations.

HORN TRAINERS.

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BURDIZZO PINCERS, etc., etc., etc.

We manufacture or stock the above.
Let us quote for your requirements.

THE FARM-ACY
23 MORRIS STREET,
PALMERSTON NORTH.

Answers to Correspondents

Discharge from Cow

A.M. (NORSEWOOD):—

On November 5 I had a cow (about fifth calver) calved. She had not been wintered too well, and I think she came in about a month before time. She did not clean properly. I inserted two antiseptic pessaries, but the biggest part of the cleanings came away. At different times she passes a lot of custard-coloured material. A few days ago I noticed her discharging some lead-looking fluid, so I swabbed her out with some Stockholm tar, and when I was doing this she passed fully a cupful of this fluid. I was rather surprised, because I thought it was time she had cleaned up. Could you tell me what is the cause of her discharging so much of this fluid? Of course, I have not allowed her to go to the bull, which I suppose is a wise thing.

Could you please advise what is the best treatment to give her? She is in good milking condition and is milking well. What I would particularly like to know is, would this discharge being dropped about the paddocks be likely to cause abortion, and what is the cause of her discharging so much of this liquid?

LIVESTOCK DIVISION:—

Without having a blood sample from this cow tested it is not possible to say whether the premature calving and retention of afterbirth were due to abortion infection or, as you suspect, to poor wintering. Undoubtedly, poor wintering may often be responsible for retained afterbirth. In any case, the abortion germs are not now likely to be present in the discharge, though they would be exceedingly numerous in the first week or two, if this were a case of infectious abortion, and even now would be present elsewhere in the system, for instance in the udder.

The retention of afterbirth has led to secondary infection being set up within the uterus, the lining of which is probably chronically inflamed. You are wise to keep her from breeding till the discharge has finally ceased. The trouble may result in permanent sterility.

Treatment which you yourself could carry out is not very satisfactory, but you would probably assist Nature by douching out, say, once a week with about a gallon of weak solution of one teaspoonful stock iodine and one level tablespoonful common salt to the gallon of water, which should be as warm as you can comfortably bear the hand in, and by feeding well, and making a mineral lick available.

Udder Trouble in Cows

"RAGWORT REX" (CAMBRIDGE):—

I would be greatly obliged if you could advise me regarding a certain udder trouble among dairy cows. The symptoms are as follows:—

The udder shows but little swelling or heat, but an opening comes in the front of the udder just at the point where the division meets the wall of the belly. It discharges an evil-smelling pus, apparently continuously, until the end of the season. When the cow is dry the "abscess" heals up.

I notice that all my heifers come in with cow pox, but this other trouble occurs only among the older cows, and any cow affected by it never gets a hard quarter or bad milk. It almost seems as if the trouble gets out via the "abscess."

LIVESTOCK DIVISION:—

The affected part as described should be thoroughly cleaned and all hard scabs removed. The following powder should then be blown on to the wound at each milking, reducing the application to once daily as the discharge lessens:—

Permanganate of potash, 1 dram.
Boracic acid, 2 ounces.
Animal charcoal, 2 drams.

There is no connection whatsoever between the incidence of this trouble and mammitis.

Cobaltised N.C.A.
WORM DRENCH

Is a treatment of proved value for **STOMACH, INTESTINAL, TAPE** and **WIRE WORMS** in sheep and lambs.

It contains Copper Sulphate, Nicotine Sulphate, Arsenic and Cobalt, and is TONIC as well as an EFFICIENT WORM DESTROYER.

Price 7/6 for 672 lamb doses or 4/6 for 336.

For Efficient and Economical Worm Drenching use Cobaltised N.C.A. Obtainable from your merchant or posted direct to you, freight paid, from

Manufacturers: TINGEY & HUBBARD LTD., Feilding

CORRECTION

Maize for Farmers: In the maize advertisement on page 228, note the line "Sacks on Trucks" should read **"Sacks in on Trucks."**

Warts on Heifer

F.M. (MATAMATA):—

I am writing to see if you can advise me. We have a heifer (two years) whose head is a mass of warts, and one eye is so heavy the lid has closed. We have been putting raw castor oil on regularly for two months, and it does not seem to be improving. Is there any other treatment you would suggest? The heifer is in very good condition.

LIVESTOCK DIVISION:——

Warts, when numerous and affecting an animal as described, should not be interfered with in any way. Experience indicates that they will disappear of their own accord after a variable period of time. If the eyelids are closed to the extent that the ordinary "tears" cannot freely escape and any signs of inflammation are present, the eyelids should be opened and the eye gently syringed (use a rubber syringe) twice daily with a warm solution of salt and water (one teaspoonful of salt to one pint of water). If this should not be sufficient to keep the eye in a healthy condition, a little yellow oxide of mercury ointment may be placed in the eye each evening.

"Trembles" in Pigs.

E.M. (NORTH AUCKLAND):—

Could you advise as to cause and treatment of pigs four weeks old, not yet drinking, staggering about as though unable to see, jumping up in the air when one tries to catch them, and later dying. The pigs have good sleeping quarters, and are not penned, being on free range all the time.

LIVESTOCK DIVISION:—

The condition affecting your piglets is known as "trembles." The exact cause of this condition is not known, and although there is a tendency to ascribe it to some hereditary factor, this is by no means established. Cases are recorded where sows having affected litter were again bred to the same boar and produced normal litters.

It is absolutely essential to the production of healthy piglets that the sow receives an ample, well-balanced diet during pregnancy.

Infection of Pigs.

E.P.C. (KUMEU):—

Could you please explain to me the reason for the following symptoms. Pigs, three to four months old, well done, go off feed and start panting. The panting continues, and the pigs become pot-bellied, thin, and eventually die. There is no cough or cold. It looks like congestion of some form to me.

My lay-out is new, the up-to-date houses are draught-proof, and the paddocks are clean, fresh rye and clover.

LIVESTOCK DIVISION:—

The symptoms shown by your pigs may result from either of two infections, namely, (1) bacillus suipestifer, (2) pasteurellosis.

(1) Is essentially a dirt disease, and where hygienic conditions are poor may cause a heavy mortality. Occasionally, it may appear where pigs are kept under good and clean conditions, but here, however, the deaths are few in number.

(2) Is sometimes called infectious pneumonia. The cause is an organism which becomes active mainly as the result of some sudden lowering of vitality, such as may result from exposure at sales, transport, irregular feeding, and changes of diet. Consequently, this disease is more likely to appear ten to fourteen days following the introduction of new pigs.

To determine which infection is present, specimens of lungs, liver, and kidney should be sent for examination to the Superintendent, Animal Research Station, Wallaceville, Wellington, a covering letter being sent at the same time.

Affected pigs should be separated from the rest so that they will be undisturbed, provided with bedding, and allowed a diet of whole-milk, molasses, and lime water. It is advisable, also, to remove the apparently healthy pigs to a clean run.

● NOW IS THE TIME.
Why put up with the same inconvenience this winter as you did last. Sisalkraft 9-ply board is unequalled for lining. Replaces plaster, cement sheets, and the like. Sisalkraft is supplied in rolls, has exceptional strength, and is attractive in appearance. Write for full details to—
HUTHNANCE & CO., Grey St., Wellington.
Savoy Bldgs., Princes St., Dunedin.

CAMFOSA DISINFECTANT FOR DOCKING LAMBS
1/3 3/- 11/6

TERRIFIC WHITE HEAT 2000° FAHRENHEIT
SPELLS DOOM FOR NOXIOUS WEEDS!

Use the BEST BURNER—science's newest discovery—for Nassella Tussock, Blackberry, Gorse, Rushes; sterilises poultry houses, floors, yards; burns off drain sides, water races, gravel paths.

IT IS *NOT* A FLAMETHROWER

Weighs only 28lbs. fully charged; requires no pressure pumping; burns only ½-gallon of diesoline an hour—cost approximately 6d.

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Send for Free Pamphlet to the Manufacturers:

The BEST BURNER LTD.
31-33 Tuam Street,
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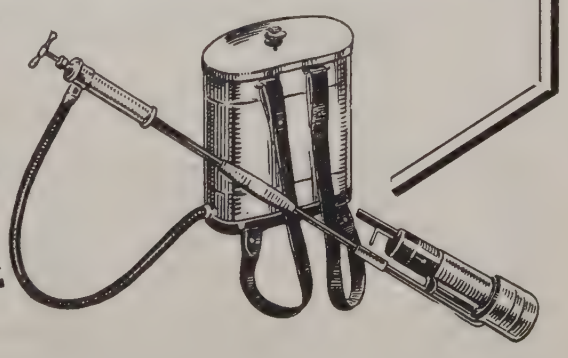

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for GROWTH! Moose Linseed Oil Cake Meal or Nuts contains 30% protein to promote sturdy growth.

for HEALTH! Moose Linseed Oil Cake Meal or Nuts contains 6% to 9% linseed oil — the finest tonic you can give an animal, and Moose is also rich in essential minerals.

THE FEEDING OF ½LB. DAILY TO YEARLINGS COSTS ONLY 2/8 A MONTH.

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P.O. Box 663,
Wellington.

Please send me, without obligation, free literature and ration advice about wintering young stock.

NAME .....

ADDRESS .....

Hints on Soldering on the Farm

EVERY farmer should include a soldering iron among his tools. Quite a number of odd soldering jobs can be done on the spot with a saving in cost and the life of many an article extended if the simple art of soldering is learnt. Briefly, here are a few points.

Acquire a soldering iron about 2lb. in weight, two or three sticks of solder, some spirits of salts (obtainable from a hardware or plumbing supply store), some small pieces of zinc (the lining of a piano case or an old wet battery rod), and a small piece of salamoniac.

In use, the iron should be faced or tinned. This is done by heating the iron to just on a dull red and then quickly filing the pointed end on the four sides from the point to about one inch back; then, by lightly rubbing the hot iron on the salamoniac and at the same time applying a little solder, a tinned face is given to the iron.

By J. A. ELLIOTT,
Leading Plumber, Public Works Department

When heating the iron for soldering, do not let it get red hot, as this removes the face. Nevertheless, it should be hot enough to melt the solder instantly. Most amateur jobs are spoilt by using an iron that is "cold" or is not properly faced.

Cleanliness is essential in soldering. Remove all rust or foreign matter by scraping or other means so as to expose the natural colour of the metal.

Spirits of salts is the plumber's choice of soldering fluids, although there are a number of good patent fluids obtainable.

Spirits of salts is used for galvanised iron, but "killed" spirits is necessary for lead, brass, and copper and tin ware. To kill spirits, place a small amount of raw spirits in an old cup or open glass jar and drop in it some clippings of zinc. When the subsequent fizzing is done the spirits are ready for use.

FARM LIGHTING BATTERIES

New plate groups to replace worn Delco and other make cells from 10/-. Guaranteed 2 years, supplied to fit any make glass or rubber jars. State make, number plates per cell, dimensions of jar.

Rokfire Electric Batteries Ltd.
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Annual subscription only 30/- (Payable in advance).

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3. Free advice throughout the year on Taxation and Legal Problems.
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6. We supply all subscribers with our specially prepared Farm Account Book (free of charge).

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Hamilton Branch: Elswick Chambers, Victoria St. Phone 4628. P.O. Box 350.
Whangarei Branch: 88 Cameron St. Phone 3007. P.O. Box 139.
Dargaville Branch. Hoskings Buildings, Victoria St. Phone 459.
Morrinsville Branch: Studholme St. Phone 126.
Managers Farmers' Taxation Service, with over 10,000 subscribers in Auckland Province.

A little practice will bring about the control of the iron. By approaching the first jobs quietly and patiently, a measure of skill is very soon acquired.

Remember:—

Have the iron hot enough to melt the solder immediately. Allow the solder to soak or "sweat" into the job.

Have a clean face on the iron. Clean the metal down to its natural state.

Apply the flux only to those parts to be soldered. Use the solder so that it runs; do not put it on in blobs.

Fluxes for various metals are:—

Galvanised iron—spirits of salts.

Tinned Goods—killed spirits, resin.

Brass—killed spirits, resin.

Copper—killed spirits, resin.

Lead—killed spirits, resin, tallow, or dripping.

How to Make a Konaki for Your Farm

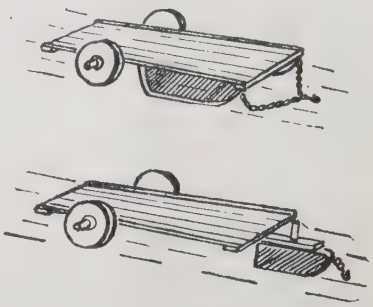
DESIGNED to give a lighter draught and at the same time be of more general use, the konaki has replaced the ordinary farm sledge on many farms in Taranaki. To those who are not familiar with this type of farm vehicle the following description with illustrations should give a good idea of how to go about the construction of one of these extremely simple and more than useful conveyances.

The name konaki is apparently derived from the Maori "Ko neke," meaning to slide, crawl or move from one place to another, and in a sense is very appropriate, even though it has come to be spelt in a different manner. The same can be said in regard to many other Maori names, and the twisting of such names to suit the Pakeha tongue is a deplorable, though at times convenient manner of expression.

Description and Use of Vehicle

The konaki is a partly wheeled and partly runnered vehicle. It can carry heavier loads than a sledge, and can be used not only in wet and muddy conditions, but has equal use for many dry weather jobs in the summer months. For this reason, it has become extremely popular in high rainfall districts, and in Taranaki, where many of the farms are of an undulating to hilly nature and where fully wheeled vehicles are not always easily used, it can be readily understood why this popularity has come about.

For instance, in the winter and early spring months, when muddy conditions prevail, the konaki is used for carting out roots, hay and ensilage for the feeding of stock and for transporting any material from one part of the farm to the other. At the same time, the lighter draught and smaller runner surface than the sledge has not the cutting-up effect on roadways and gateways. It is also easier to manipulate than the sledge, and thus has a distinct advantage when continually carting materials. In the summer months equal use can be made of the vehicle, such as in bringing in hay crops, carting out fertilisers, for top-dressing and cropping purposes, and for many other farm jobs.



A diagram of two types of konaki.

A konaki with a single runner extended in front of the vehicle. Equipped with a 200-gallon tank, this vehicle has been used for distributing liquid manure.

A Well LIGHTED HOME for Next to Nothing

Enjoy a lighted home equal to city residents, with your own lighting unit. While your milking engine is running it can be providing electric power at next to nothing! Write for our catalogue and full instructions and you can install your own electrical system.

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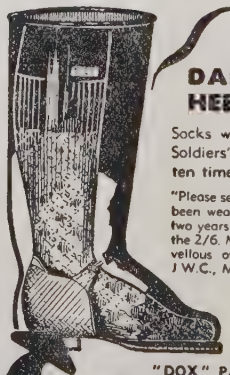
P.O. Box 471X. CHANCERY STREET, AUCKLAND.

ELECTRIC BULBS--We have ample stocks of 6, 12, 18 and 32 volt bulbs to provide our customers with their usual requirements.



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In visiting farms in a district such as Taranaki, one sees many designs of konakis, but the most common types are those equipped with steel-rimmed wooden or other wheels and a single swivelling runner in the front. Another fairly common type has wooden or other suitable wheels and short double-fixed runners. Originally, konakis were all made with wooden wheels, but these are not essential, and many farmers make use of old motor car wheels and tyres, or old mower wheels or any other wheels of suitable size and width which have been discarded from other vehicles.

The Decking

The decking of the konaki is made of one-inch timber bolted or nailed on to a frame, and the standard size for this portion of the vehicle is 6 feet long by 3 feet 6 inches wide. Some well-made konakis are equipped with brakes, but these are necessary only on very steep country, and most farmers rely on a chain or even a stake inserted through one or both wheels to check excessive speed on steep slopes. The wheels are placed approximately one-third of the distance from the back of the frame or in a position to give balance to the whole vehicle and not put excessive weight on the runner or runners. A single runner may be placed directly under the fore-part of the vehicle, or it may be extended on a wooden bar out in front.

A konaki equipped with wooden sides. The single runner is placed under the fore-part of the vehicle.

From the above it will be seen that the konaki has advantages, and its light draught and ease of manipulation at all times of the year and under all conditions would give it an extremely useful place on any farm in New Zealand.

—J. M. HOPKINS, Instructor in Agriculture, New Plymouth.

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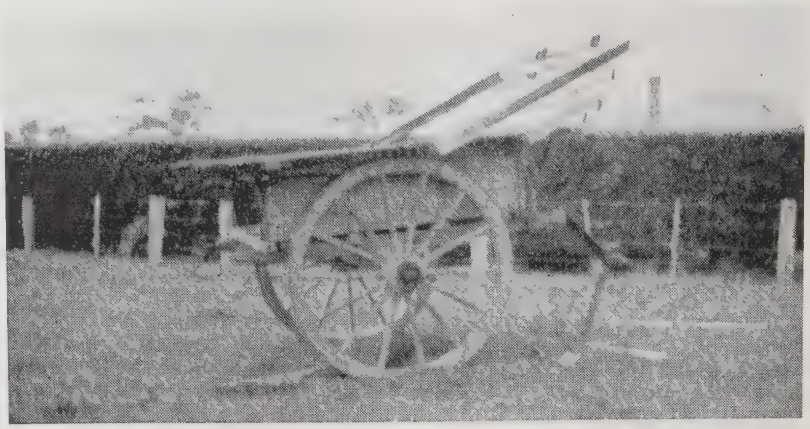
Tip-dray for Filling Ensilage Pits

MANY concrete and earth pits are used in Taranaki for the making and storage of ensilage, and in most cases the material is swept to the pit by means of sweeps of various makes and kinds.

To facilitate the filling of two large concrete pits on his farm, a farmer in North Taranaki uses tip-drays and a pick-up hay loader. As soon as a dray is loaded it is detached from the hay loader and taken in to the pit, where it is backed on to a heavy log placed across one edge of the pit mouth. The dray is then tipped, and the material slides into the pit to be spread and tramped.

As only small loads could be taken in if just the dray were used, and as the material would not slide off an ordinary dray frame, a special slide frame has been constructed for the drays. This frame is simply a flat platform with an inclined front bolted to the sides of the dray the size depending on the dray and the power in bringing in the material. The illustration shows a tip dray equipped for tractor haulage and fitted with the special platform frame.



Ensilage is heavy material, and this method of filling pits is considered a great advantage in handling.

—J. M. HOPKINS, Instructor in Agriculture, New Plymouth.

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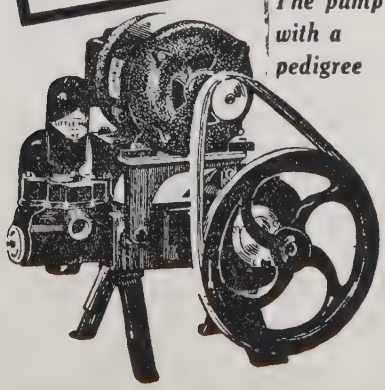

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Radio Broadcasts.

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

May 4.—"N.Z. Flax and Its Commercial Use," by W. J. Scollay, Hemp Grader, Department of Agriculture, Auckland.

May 11.—"Cultivation for Farm Crops," by Mr. E. B. Glanville, Instructor in Agriculture, Auckland.

May 18.—"Culling and Selection of Breeding Stock," by Mr. E. C. Jarrett, Poultry Instructor, Department of Agriculture, Auckland.

May 25.—"Young Farmers' Club Session," address by the Organising Secretary, Mr. S. Freeman.

Pig Industry Broadcasts.

THE following programme of radio broadcasts will be given under the auspices of the National Pig Industry Council during May:—

1YA, Auckland, May 21, 7.15 p.m.—"Concrete for Piggeries," by Mr. N. W. Carter, Supervisor, Bay of Plenty District Pig Council.

2YA, Wellington, May 5, 7.30 p.m.—"Litter Production," by Mr. C. H. M. Sorensen, Supervisor, Taranaki District Pig Council.

3YA, Christchurch, May 21, 7.15 p.m.—"Litter Production," by Mr. H. W. McIntosh, Supervisor, Canterbury District Pig Council.

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A Modified Concrete Roller

IN general, concrete rollers, whether required for cultivated ground or for pastures, are constructed as a complete cylinder with a fixed axle running through the centre.

Such rollers, while efficient in consolidating the soil, lack flexibility, with the result that turning is difficult and there is a distinct tendency to disturb soil levels at every turn. Whether this occurs on cultivated land or on saturated pastures which require rolling, the effect is most unsatisfactory to the farmer concerned.

In order to overcome this defect a farmer on the Hauraki Plains has constructed a concrete roller in sections,

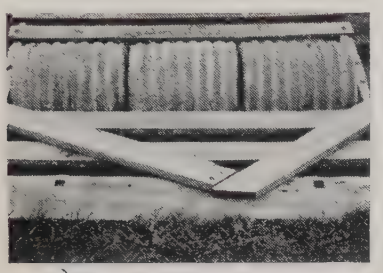

Figure 1.

each section being an independent unit possessing a central bushed passage through which an axle common to all sections is passed. Between each section and its neighbour a stout washer is inserted to prevent the vertical surfaces from rubbing against one another.

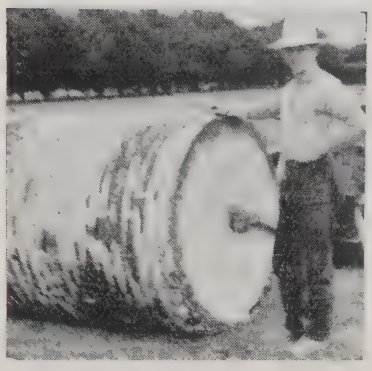

Figure 2.

With such a roller (see Fig. 1) turning is simplified, as each section moves according to the effect the tractor has upon it. In the case of a roller shown in Fig. 2, however, the rigidity of the implement prevents smooth turning, with the result that it is forced around against the soil, and so gouges out one part and heaps up another.

The concrete roller, built in sections, is certainly worthy of consideration if the initial cost of a Cambridge roller is thought to be prohibitive for the work to be done.

—C. WALKER, Instructor in Agriculture, Thames.

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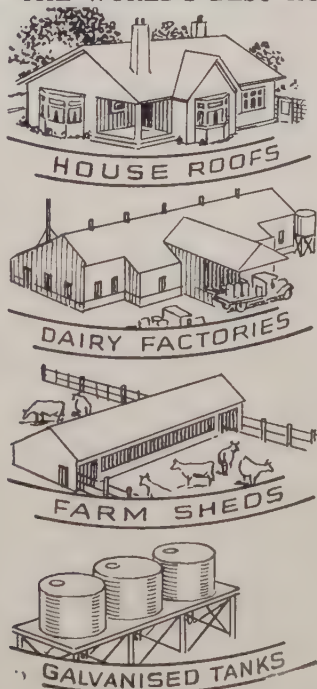

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In the Orchard and Vineyard

Orchard Notes

Late Picking and Autumn Work

WITH the exception of the later varieties of apples, the harvesting of the fruit crop for the season will be drawing to a close. There will still be a large quantity of Sturmer apples to be picked, and careful handling is necessary to avoid bruising. The best plan is to leave the packing for a day or two after picking, when bruises will become visible and can be eliminated when packing. Sturmer apples left on the trees to attain the proper maturity for immediate marketing should be closely watched and picked before any traces of "ripe spot" appear. This disease develops and spreads very rapidly, and any fruit showing the slightest signs of this trouble should be disposed of as quickly as possible.

Mid-season fruit stored under orchard conditions should be examined periodically and forwarded to the assembly shed before its maturity is too far advanced.

More time will now be available for a general clean-up. All rejected fruit should be disposed of by burning or burying, and picking cases should be cleaned and repaired and stacked away for next season's operations. The grading machines should receive a final overhaul, and all parts should be cleaned and oiled, and repairs effected where required. The packing shed itself should receive a general clean-up, and its surroundings should be made as hygienic as possible.

Stone Fruit Spraying

With some varieties of peaches, two applications of spray are necessary to control peach leaf-curl, while with other varieties one application at the bud-movement period in the spring is sufficient. An autumn spray at the leaf-fall period, using Bordeaux mixture at strength 5-4-50, followed by the usual spring application at the same strength, should effectively cope with the disease. A spray at this time of the year will also act as a good clean-up for the season and assist in controlling other fungus diseases that may be found in the orchard. When spraying is finished for the season the outfit should be thoroughly cleaned, necessary repairs effected, and everything left in good order for spring.

Autumn Ploughing

Autumn ploughing has many advantages over spring ploughing, and this practice is recommended wherever possible. Ploughing may be done to a greater depth during the autumn than is advisable in the spring, although the ploughing should not be so deep as to injure the roots. The depth will largely depend on the nature of the soil and whether the trees are deep or shallow-rooted. In orchards where surface water is liable to collect during the winter, it is advisable to plough up to the trees, leaving the open furrow in the centre of the rows for drainage purposes.

Manuring

The three essentials in manuring are nitrogen, phosphoric acid, and potassium, to be used as a complete manure or singly according to the soil requirements. Applications of phosphoric acid in the form of superphosphate and potassium in the form of sulphate of potash give best results when applied during the autumn season and turned under when ploughing. Nitrogenous manures may be left until growth starts in the spring, when two applications should be made, one in September and one in November. Generally speaking, for complete manuring the 2-1-½ formula of phosphoric acid, nitrogen, and potash will be found satisfactory. As a general manure blood and bone at the rate of 3 to 4 cwt. per acre with additions of potash should give good results.

Drainage

Autumn is the best time of the year to attend to the drainage system in the orchard. Open drains should be cleaned out, and covered drains examined to see that the flow of excess water from the orchard is being maintained. New lateral drains, where required, should be dug.

Shelter Belts

Where the shelter trees have become too high, more especially surrounding comparatively small areas of orchard, resulting in the exclusion of light and air and causing poor growth and cropping, particularly in the fruit trees situated adjacent to the belts, the judicious topping of the shelter belts will be an advantage. If roots of the shelter trees are encroaching too far into the orchard, a trench should be dug alongside to prevent further extension.

—G. STRATFORD, District Supervisor, Dunedin.

Citrus Notes

Spraying to Prevent Infection

DURING late April and May measures should be taken for the prevention of an infection of citrus brown-rot. All citrus trees should be thoroughly sprayed with Bordeaux mixture 3-4-50, giving particular attention to the foliage and stems within three to four feet of ground level, and a cover crop should be sown under the spread of the branches. Where this disease has previously been severe and a cover crop has not been sown, prune the trees to allow 3 feet clearance between the lower branches and the ground and stir the soil frequently. This pruning, however, should not be overdone, as much of the best citrus fruit is grown near ground level.

Citrus brown-rot, *Phytopthora citrophthora*, is a soil fungus which reaches the reproductive stage under conditions of excess soil moisture which are common in July or August. The spore, which is capable of developing into a new fungous plant, is splashed by rain on to leaf, stem, or fruit. Following infection, the leaf turns brown and wilts, the stem shows small, dead areas on laterals, and the fruit turns a greyish brown, decays, and emits a pungent smell. As prevention is the soundest practice for control of citrus brown-rot, apply an autumn Bordeaux mixture spray at the recommended strength of 3-4-50. If infection appears later, remove all

visibly infected material and burn or bury deeply.

To prevent picking cases becoming infected with citrus brown-rot, they should not be allowed to lie in the orchard during rainy weather. On return from the lemon assembly depots, cases should be scraped, dipped into a solution of Shirlan W.S., 1 part in 1000 parts water, and then stacked under cover. When picking, every care should be taken to prevent infected fruits being placed in the same cases as sound fruits.

Besides controlling citrus brown-rot, the application of Bordeaux mixture 3-4-50 in the autumn will assist in the control of verrucosis, melanose, grey-scab, wither-tip, and citrus blast.

Wither-tip is often better known by its scientific name *Glomerella*. It is a fungous disease causing irregular dead spots on the leaves, a dying back of the stems, and premature shedding as well as brown, depressed spots on the fruit. This fungus attacks unthrifty trees, and is often observed in spring on ripening New Zealand grapefruit. In conjunction with the spray recommended, remove and burn all dead and weak growth.

Citrus-blast is a bacterial disease most active in exposed orchards in late winter and early spring. Infection follows injury by thorns, hail, and frost, lemons being more affected than oranges. Citrus-blast causes firm, black, circular pits on the fruit, as well as a blackening of punctured leaves and twigs. To check citrus-blast, remove and burn infected material, provide adequate shelter, and harden off autumn growth by refraining from adding quick-acting or excessive quantities of nitrogenous manures at this season. In addition, an autumn spray of Bordeaux mixture 3-4-50 must be used.

A scale insect which is becoming increasingly common on citrus trees as well as on several other hosts, especially puriri, is the hard-wax scale, *Ceroplastes sinesis*, fomerly known as the white-wax scale. The hard-wax scale secretes honey dew, and an infested citrus tree soon becomes coated with the sooty-mould-fungus, *Capnodium citricolum*, which grows on this honey dew. During April and May the young scales are small and star-shaped, and appear on the upper surface of the leaves, especially on the main and side veins, and in that stage are most vulnerable. For control, spray with a certified summer oil—1 part summer oil to 33 parts of water or in small quantities, 1 pint oil in 4 gallons water. Once the scales have grown and infest the stems and small branches, they are much more difficult to control because of their waxy covering.

—A. M. W. GREIG, Citriculturist, Auckland.

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Cool Storage Notes

Holding Pears for Marketing

PEARS should now be carefully stacked in cool storage, and should receive special attention until required for marketing. The flesh temperature of pears should be maintained at 31deg. F. and the temperature of the storage atmosphere should not be permitted to rise above 33deg. F. between the time the refrigerating machinery is shut down and the time it is restarted. If the pears have been picked and placed in cool storage at the correct maturity, these temperatures will check the respiration of the fruit sufficiently to ensure that it may be held during the remainder of the season in a firm and green condition.

The relative humidity of the storage atmosphere for holding all varieties of pears should be maintained at 90 per cent. in order to minimise wilting of the fruits, particularly during long period storage.

In order to obtain the maximum refrigeration from cool storage plants during peak periods of the season, the following points may be found useful:—

(a) Make sure that the refrigerating plant is fully charged with ammonia.

(b) Remove oil, air, and foreign gases from the ammonia system at regular intervals.

(c) Examine and clean oil and scale traps occasionally.

(d) Check ammonia gauges for accuracy.

(e) Examine the distribution of the ammonia condenser circulating water, and record the temperature of the water in the daily log.

(f) Defrost cooling pipes regularly when this is necessary, as a ring of ice on the piping will reduce the cooling efficiency of the plant.

(g) Keep the ammonia compressor gland packing in good condition, and renew the packing when necessary to avoid loss of ammonia, as a small leak will soon lose a considerable amount.

(h) When calcium chloride solution is used as a brine spray over the cooling pipes, the solution should be constantly maintained at the correct specific gravity for the brine temperature required.

A daily record of all the details of the running of the refrigerating plant, chamber temperatures, and relative humidity should be methodically attended to each day and entered in a previously prepared daily log sheet.

—A. A. POWELL, Cool Storage Officer, Wellington.

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Guide for the Home Garden

Profit by Last Season's Successes and Failures

"A garden of vegetables is a beautiful thing—if it is a good garden."

AS not much by way of sowing seeds or setting plants can be done during this month and June, it would appear opportune to make a review of the successes and failures (if any) of the past season's operations, to profit by the experience gained, and to plan for better production in the season immediately ahead. If, by the methods practised for digging, seed-sowing, planting, and manuring anticipated results were not realised, the reason should be sought and, if practicable, the remedy applied.

Did a certain variety of vegetable have too much shade; was another crop exposed to winds which were inimical to its best development; were rows of certain crops planted too far apart, thus wasting valuable garden space; were other crops planted too close and by the humid conditions thus engendered invite disastrous attacks of fungoid diseases? Were some vegetables, because of unsuitable weather conditions, planted too late to enable them to reach proper maturity; were others planted too soon, to encounter adverse weather conditions which resulted in stunted growth or caused premature seeding of the crop; were some plants set out before being properly hardened off, the result of which meant disappointment and serious loss? Was the composition of the soil used in seedling boxes mixed with the correct proportions of soil, sand, and compost? Did any diseased crop residues find their way into the compost heap, and was the soil taken from the compost heap sterilised before it was used? Was any attempt made to test the germination of seed before sowing took place? If tests were made and results unsatisfactory, was the seedsman from whom the seed was purchased advised of the result? If plants were purchased, were these suitable for planting at the time they were set out, and were they true to type? What manures were used, and were they suitable for the varieties of plants grown? Did the green cover crop which was grown and dug in realise the anticipated effect on the garden?

Make Plans Now

These are a few of the questions which should be asked and answered by every home gardener when reviewing the operations of the past season's production. Next season, an additional effort to increase the quantity of vegetables formerly grown will be necessary, and plans should therefore be laid as early as possible and preparations made for carrying them into effect.

Reference to the introductory quotation raises the question: "What constitutes a good garden?" A garden has been defined as "a piece of land appropriated for growing plants." In a good vegetable garden it is not enough merely to grow plants. To be a good vegetable garden it must produce edible plants for human consumption during almost any season of the year. Continuity of supplies should be the objective of every home gardener. "Planned production"—a more or less popular phrase at the present time—can be adopted in the kitchen garden, thus ensuring supplies of vegetables during winter as well as summer.

Seasonal Don'ts

Don't

neglect early spring cabbage plants. For slugs and snails use burnt lime freely. It is best applied in the evening.

Don't

permit ashes from wood fires to be exposed to rain. These contain valuable potash, which will be leached into the soil.

Don't

allow fowl manure to get wet. It becomes sticky and unworkable, and, in addition, loses most of its valuable plant food. Keep it in a dry shed, and occasionally mix it with two or three handfuls of superphosphate.

Don't

neglect the crops in store. Inspect them periodically, and remove all diseased specimens. By spreading disease, these constitute a menace to the remainder of the crop.

When In Trouble

When results from growing your own seeds and growing your own plants are unsatisfactory and you are why not consign your troubles to the worrying over the probable cause, Director of the Horticulture Division, P.O. Box 3004, Wellington? He may be able to assist you. Write him now.

Planting Out Of Season

PLANTING out of season is important, and should give every home gardener serious thought. Because of the vagaries of climatic conditions, it is not possible to state with any degree of definiteness a time for sowing seeds or setting plants of any particular variety of vegetable which would be applicable throughout the Dominion. Care should therefore be taken to see that vegetable seeds are sown at a time suitable for the production of plants which, when set in the garden, will have every reasonable chance of growing to maturity. Vegetable plants are often purchased which are quite unsuitable for planting at the time they were exposed for sale.

Spring cabbages should not be planted in November or December, nor should summer cabbages be planted during January. The former variety, if properly grown by the home gardener, will be harvested before December, and summer cabbages should be ready for cutting before Christmas. These examples will be sufficient to direct attention to the necessity of sowing seeds and setting plants at suitable times in different seasons.

What to Do in the Home Garden Next Month

Summary of Operations During May

VEGETABLE SECTION

Successional Sowings.—Nil.
Other Sowings.—Broad beans.

SEEDLINGS TO TRANSPLANT AND PLANTS TO SET.

Spring cabbage (Flower of Spring): cauliflower. Potato onions: these should not be planted deep, the bulb being only half covered. Rows may be 12 to 15 inches apart and 6 to 8 inches between the bulbs. Shallots should not planted until later.

IN WARM DISTRICTS.

A sowing of peas may be made for early spring picking. A well-drained part of the garden is necessary. Varieties recommended are W. F. Massey and Earlikrop.

Asparagus: All top growth which has completely withered should be removed and destroyed and fertiliser applied. Blood and bone 2 parts and superphosphate and potash 1 part each, all by weight, applied at the rate of 1½lb. to 12 ft. of row, will be suitable.

CROPS IN SEASON.

(The month in brackets represents the month of sowing the seed.)

Salads.—Lettuce (June, July, Aug.); endive (Jan., Feb.); celery (Sept., Oct., Nov.); capsicum (Aug.-Sept.).

Greens.—Cauliflower (June, July); Brussels sprouts, curly kale, Savoy cabbage (Oct., early Nov.); spinach (Feb., Mar., July, Aug.); peas (early dwarf—Feb., Mar.; main crop—May, June, July).

Root Crops.—Artichokes (Aug., Sept.); turnips (Mar., Sept., Oct., warm districts any season); swedes (summer and autumn); parsnips (Sept. to Nov.); leeks (Oct.).

GENERAL WORK.

Every opportunity should be taken to clean up the garden, trim boundary hedges, destroy weeds and old crop residues. Dig any spare part of the garden, and, if it is not intended to sow with a cover crop, throw the soil up roughly and leave exposed to all the winter weather. Treated in this manner, soil is much easier to work in early spring.

Care of Tomatoes and Rhubarb

MOST outside-grown tomato crops will now be showing signs of exhaustion, and it is important that, when practicable, every tomato that can be ripened should be saved for consumption. As soon as there are indications of frost, all fruit should be removed and stored. A glasshouse, however small, is an ideal place for the purpose. Should this not be available, a shed, where the temperature will not become too low for some time, can be used. The tomatoes, however, should not be placed on the floor of an outhouse; shelves are the better place. Whatever the nature of the building used, the tomatoes should be placed on a litter of straw or hay 3 to 4 inches deep. Stored in this way, all "mature green" fruits will ripen, and, it may be, a few others on which colour was not showing at time of picking.

When harvesting has been completed the vines should be dug out of the ground, and, if practicable, hung over a fence, where they will become thoroughly dry before destroying them by burning. This operation completed, the ground previously occupied by the tomato plants should be turned over and sown to a cover crop, which will be dug under before any vegetable crop is planted on the same piece of ground. This practice of growing green crops for digging in should constitute the golden rule of all home gardeners.

Onions

Young onion plants will now be making satisfactory growth, but they may be assisted in development by weekly applications of weak liquid manure, which should be applied between the rows of plants—but not when the soil is dry. After applying, the manure can be worked into the soil with a dining fork.

Rhubarb

Late this month, or early in June, rhubarb will require particular attention. It is a valuable plant for domestic use, and should certainly find a place in every kitchen garden. For late spring and summer, Linaeus, Victoria, and Champion Seedless are the most favoured varieties, Topps Winter and Crimson Winter being generally grown for winter production.

As a general rule, rhubarb should not be permitted to remain in the same place longer than three—or at the most four—years. Longer than this leads to deterioration of the crowns, the outward manifestation of which is the production of weak, spindly stalks. Removal of old crowns should therefore be carried out without delay, and this is best done by the use of a sharp spade. Place the spade a short distance from the root with a slight incline outward. In this position, push the blade of the spade into the soil to the full depth, repeating the operation until the circle round the whole crown is complete. By this means, the extended roots will be severed and the whole mass, which will include a considerable quantity of soil, may be levered up to the surface by the use of the spade.

Remove the soil from the roots by banging with the back of the spade or dropping the crown a few times on the ground. Trim the roots roughly —not too close to the "buds"—and then place the crowns in a position where they will get plenty of rain. If the roots at any time appear dry, either hose them or throw a few buckets of water over them. About July the "buds" should begin to appear prominently, and, when this growth starts, it is time for the crowns to be "divided." This is best done with a large heavy knife, a sharp tomahawk, or a cleaver. Cuts should be made between the buds, and only the strongest of these selected for planting, with which is retained as much of the old root as possible. There is a general rule among market gardeners—and it is recognised as the best practice—that only single buds are planted.

Manuring

It is questionable whether any other plant in the vegetable kingdom will stand such heavy manuring as rhubarb. Land in the home garden in which it is intended to plant rhubarb should be trenched early to a depth of 2 feet, the bottom spit of soil being thoroughly mixed with well-rotted stable manure. Well-weathered straw with which has been mixed a good handful of sulphate of ammonia will make an excellent substitute for the stable manure. This mixture should be well trodden down before planting takes place. The material incorporated with the soil will rot, make humus, assist the development of the large fleshy roots of the plant, and better enable those roots to forage for plant

(*Continued on page 278.*)

Seasonal Work for Beekeepers

Standardisation and Grading of Honey

HONEY standards are created by the consuming public. The trade is able to gauge fairly accurately the class of honey required for all markets by the preference shown by consumers for certain qualities. Commercial interests could not dictate the class of honey that shall be bought, and do not attempt to do so.

All New Zealand honey consigned in bulk containers to the Internal Marketing Division is now graded under three headings—flavour, colour, and condition. This was made possible by the present repacking system, which deals with the granulation of all honey repacked for retail trade. While grain, coarse or fine, is not taken into consideration, the nature of the granulated state of spoiled honeys may become a factor. Spoiled honey is usually honey which has passed through a melting process to separate it from wax cappings, and which has been very much overheated. Excessive or prolonged heating drives off the natural moisture content of honey, and gives it a caramel flavour and an undesirable toughness of body. This condition is quite obvious in granulated honey, while in liquid form the same condition is detected by its dull colour, caramel flavour, and abnormally heavy body. Honey overheated to the point where the natural flavour has been destroyed completely is rejected.

Flavour.—To gain the maximum points possible for flavour the beekeeper must take care not to introduce foreign flavours at packing time. Unclean utensils should be avoided, and anything giving off an unpleasant odour should be removed from the extracting room. While honey can always be sold at a price if the flavour is good, it cannot always be sold on colour.

Colour.—The only way colour can be impaired is by overheating or the introduction of foreign matter. Propolis will sometimes cause trouble if it is scraped in large quantities from the frames down into the cappings and warmed up with the honey when the cappings are dealt with. Flavour may also be impaired in this way.

Condition.—The slightest objectionable feature will cause rejection, irrespective of other qualities. There is, however, sufficient room in the grading system for penalties for preventible defects.

Honey must reach the required standard for water content, and honey below 1.420 specific gravity is rejected.

Surface specks of wax and pollen or any foreign matter, air bubbles, dull colour condition, and poor body all carry penalties. Poor body may be caused in two ways—low specific gravity, which indicates an excess of moisture, or by an excess of levulose. The former condition may be avoided by extracting only capped honey and by careful storage to prevent the absorption of moisture, while the latter depends on the class of nectar gathered by the bees.

Faulty Packing.—Because of its weight, honey requires the strongest of packages, and two-inch nails are required to hold a case firmly together when full. At least four two-inch nails should be driven in each end of the tops and bottoms of cases, and the side pieces should be secured similarly.

Extraction Marks.—Some beekeepers send to the grade store successive lines of honey of different quality and no extraction marks. The cases of each line submitted for grading should be marked with a letter or number one inch high stencilled on the top right-hand corner of each case. Beekeepers are requested not to use the same extractor or quality mark on two different lots of honey in the same season. A good plan is to use letters one year and figures the next.

Liquid Honey Supplies.—Honey consigned to the grade store in liquid or semi-liquid condition must be packed in tins made to special specifications, particulars of which may be obtained from the Internal Marketing Division. The cases should be 19¼in. long, 9¾in. wide, and 14½in. deep, inside measurements, with 7-8in ends and ½in sides, tops, and bottoms. It is an advantage to use a piece of corrugated paper inside the top and bottom of each case to ensure a close fit and prevent any movement of the tins.

Intending suppliers of bulk honey who have not already obtained a registered brand number should apply to the Internal Marketing Division before consigning any honey to the grade store. —*T. S. WINTER, Senior Apiary Instructor, Wellington.*

CARE OF TOMATOES AND RHUBARB.

(*Continued from page 277.*)

food located in the soil. It is very important that the soil should be pressed down firmly previous to planting.

Before planting, a hole of suitable size should be dug, and, while holding the crown in an upright position, the soil should be gradually filled in, pressing it down as filling proceeds, and at intervals mixing with it blood and bone manure at the rate of two or three handfuls to each crown. Dry fowl manure is also suitable for this purpose. When planting is completed, the "bud" should be covered to a depth of not less than an inch below the soil level. Occasional dressings of fowl or cow manure during the growing season will be beneficial. Should these manures not be available, a handful of blood and bone may be applied to each crown and worked well into the soil. Deep cultivation of this crop—at any period of growth—should never be adopted. Copious watering is necessary during late spring and summer.

As half a dozen good crowns may be sufficient for the usual sized kitchen garden, it would be an advantage to plant these in a single row, selecting a place in the garden where the dense foliage of the rhubarb will not throw any undesirable shade on other crops growing in close proximity. It may be pointed out that during the first season few stalks, if any, should be removed from the crowns. If this precaution is not observed the future productivity of the plants will be seriously impaired.

—*D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.*

SUBSCRIPTION RATES.

The *Journal* is issued monthly. The subscription within New Zealand, which is payable in advance and includes postage, is 2s. 6d. a year. The overseas subscription is 5s. Subscriptions should be forwarded or paid direct to any office of the Department of Agriculture in the Dominion. Single copies, price 6d., are available from the Department of Agriculture, Box 3004, Wellington.

The Theory and Practice of Poultry Feeding

(Continued from the March issue.)

By F. C. BOBBY,
Superintendent of Poultry Husbandry,
Wellington.

IN the March issue of the "Journal" food essentials or food ingredients, such as proteins, carbohydrates, etc., were described in detail. This information may now be used to assess the relative values of poultry foods and their suitability for blending together into mashes for feeding to birds of all ages. It is a common practice to set out in a "Food Composition" table the amount of food ingredients of any given poultry food, these amounts being expressed in percentage form. It will also be observed when studying "Food Composition" tables that two sets of percentage figures are quoted, namely—

(a) Total per cent. of food ingredients.

(b) Per cent. digestible food ingredients.

This requires an explanation, although it is obvious what is intended by total food ingredients. Of these total food ingredients, however, it has been found by scientific investigation that only a proportion are digested by animals or poultry. The amount digested varies with individual foodstuffs and with different classes of livestock. Speaking generally, the figures given in tables for digestible food ingredients have been obtained with heavy farm stock and not with poultry. Nevertheless, those figures are useful to poultrykeepers, although admittedly not entirely accurate for birds. That portion of any food ingredient which is not digestible (the difference between the total per cent. and the digestible per cent. figures) is passed out of a bird's or animal's body as a waste product. For this reason, it is usual to take the "digestible figures" when making calculations for assessing the value of a poultry food or ration. The following analyses of pollard and wheatmeal will illustrate the point made above:—

TOTAL INGREDIENTS.

	Pollard.	Wheat-meal.
Protein	16%	12%
Soluble carbohydrates	56%	69%
Oil	4½%	2%
Fibre	6 %	2%

DIGESTIBLE INGREDIENTS.

	Pollard.	Wheat-meal.
Protein	13%	9½%
Soluble carbohydrates	50% (including fibre)	65 % (including fibre)
Oil	3½%	1¼%

The difference between the total per cent. and digestible per cent. of the food ingredients in the two examples quoted is not great, but wider differences are found, particularly in the instance of meat-meals, where a 72 per cent. total protein gives only a 64 per cent. digestible protein. A brief study of the figures for pollard and wheatmeal reveals the fact that the latter contains appreciably more carbohydrates than the former, a point to be considered when substituting wheatmeal in place of pollard. Wheat-meal may fatten where pollard will not, especially in the instance of breeding hens. A further point to bear in mind is that these figures refer to an average sample of any given food, whereas there will be some variations in composition between different consignments purchased from time to time. In point of fact, however, average figures of composition are valuable, and should be understood by the modern poultrykeeper.

Obviously, poultrykeepers will not wish to memorise the compositions of the poultry foods in common use, and for this reason a table is now included to which reference may be made at any time.

It will be observed that in addition to the per cent. of digestible food ingredients there are a further two sets of figures. Those in brackets adjacent to the digestible fibre represent the total crude fibre, while a fifth column has been included, the per cent. of ash or minerals. The figures for total fibre-content are valuable information, as it is known that fibre cannot be readily digested by poultry, and when in excess may actually be harmful.

COMPOSITION OF POULTRY FOODS.

	Per Cent. Digestible Food Ingredients.			
	Protein.	Oil.	Carbohydrates.	Fibre.	Ash.
Wheat or wheat-meal	9.5	1.25	63.5	1.0 (2)	1.75
Maize or maize-meal	7.5	2.75	63.75	0.75 (2)	1.25
Barley or barley-meal	7.25	1.25	61.0	2.5 (4.5)	2.5
Oats or ground oats	7.5	4.0	45.0	2.5 (10.0)	3.0
Pollard	13.0	3.5	48.0	2.0 (6.0)	3.75
Bran	11.75	3.25	40.75	3.5 (9.5)	5.75
Lucerne-meal	15.5	—	31.5	8.0 (16.0)	11.0
Meat-meal (60% protein) ..	42.0	10.5	—	—	19.0
Copra-meal	17.0	5.0	30.0	4.0 (6.5)	5.0
Dried skim-milk	31.0	0.25	49.0	—	8.0

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Thus, where there is a high fibre-content, the feeding value of a food is lowered for poultry. This is the reason for stating that a poor sample of oats (that is, a high proportion of husk to groat or grain) has a poor feeding value for birds and is consequently an uneconomical food to feed. Figures for mineral-content have been included, as they act as guide when determining how much additional mineral mixture should be added to any given combination of meals when blending a mash. Note the difference in mineral-content between meals such as wheat-meal (ground wheat), maize-meal (ground maize), bran, and lucerne-meal.

It will be noted that no reference is made to the vitamin-content of these foods, but it will be recollected that vitamins are existent in such minute quantities that it is impossible to measure them by ordinary standards.

The next step is to consider what points are of importance when compounding a mash and how the food analysis table can be used. Points of importance may be enumerated as follows:—

(1) The proportion (or ratio) of protein to carbohydrates and oil present in a ration.

(2) The mineral and vitamin-content according to the class of stock to be fed.

(3) The physical condition of a mash —its bulkiness.

(4) Palatability.

(5) Cost.

It may be stated here that (5) cost cannot be discussed under present conditions, as prices and supplies available of the various foods vary according to district. For obvious reasons, price has to be considered by the poultrykeeper, but it is as well to remember that the cheapest foods to buy may not necessarily be the most economical to use. This fact is too often overlooked, and must be discussed in greater detail later.

(1) Ratio of Protein to Carbohydrates and Oils

The ratio of protein to carbohydrates and fats is usually referred to as the "Nutritive Ratio," and serves as a rough check upon the suitability of a mash for poultry. It has been used as such for a number of years by poultrykeepers, who commonly refer to it as obtaining "a balanced ration or mash"——that is, a desirable balance between the protein present and the other essential food ingredients. Quite definitely, however, the "Nutritive Ratio" affords only a rough check, as today science has made it possible to ascertain the actual amount of digestible protein required by a bird, having regard to its age, weight, and rate of production, if in lay. This introduces far more complicated methods of calculating the efficiency of a mash, and, although more accurate, these methods are beyond the scope of these particular articles.

Most poultrykeepers realise that there is a definite limit to which protein may be added to a mash with safety, but many do not realise that if the starchy ingredients (carbohydrates) are allowed to get out of proportion, excess fat may be the result. A knowledge of the ratio between the proteins and the carbohydrates and fats is therefore of interest and value. The method or formula for obtaining this ratio is expressed as follows:—

$$\text{Nutritive Ratio} = \frac{(\text{Digestible fat} \times 2\tfrac{1}{4}) + (\text{digestible carbohydrates})}{\text{Digestible protein}}$$

The following is a simple explanation of the above:—

(a) Take the figure for fat from the analysis table and multiply it by $2\frac{1}{4}$ or 2.25. Fat digested by a bird will produce two and a quarter times as much heat and energy as carbohydrates (starch), and thus in the calculation above the figure for fat is multiplied by 2.25 to bring both figures to a common basis (that is, fats and carbohydrates).

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(b) To fat multiplied by 2.25 add the figure for carbohydrates. For animals, it is usual to add also the figure for digestible fibre, but for poultry this is hardly advisable, as birds are not able to digest fibre to any appreciable extent.

(c) Having obtained the sum total of the fat and carbohydrates, divide this figure by the amount of digestible protein, working to the first decimal place.

Note: The per cent. figures in the analysis table represent the weight of, say, protein in 100 units (pounds) of the food in question. To find the amount of protein in a food in a mash, divide the table figure by 100 and multiply by the number of pounds of that food. A study of the following example will show how a Nutritive Ratio is obtained:—

		Protein.	Oil.	Carbohydrates.
Pollard	36 lb.	(36 × .13) = 4.68	(36 × .035) = 1.26	(36 × .48) = 17.28
Bran	12 lb.	(12 × .11) = 1.32	(12 × .032) = .38	(12 × .40) = 4.8
Meat-meal	4 lb.	(4 × .11) = 1.68	(4 × .105) = .42	
Minerals	2 lb.			
	54 lb.	7.68	2.06	22.08

$$\text{Thus N.R.} = \frac{(2.06 \times 2.25) + 22.08}{7.68} = \frac{4.68 + 22.08}{7.68} = \frac{}{7.68} = 3.4$$

Therefore, the Nutritive Ratio is said to be 1 to 3.4, or 1 part protein to 3.4 parts carbohydrates and fat. Now, for laying birds the ratio should be between 1 to 4 and 1 to 4½, thus indicating that this mash is too rich in protein. However, the mash would be fed with an equal amount of grain daily, and this must be taken into consideration.

Mash	54 lb.		7.68
Wheat	54 lb. ..	(54 × .095) =	5.3
	108 lb.		12.81

$$\text{Thus Nutritive Ratio} = \frac{(2.7 \times 2.25) + 56.37}{12.81} = 4.8 \text{ or } 1 \text{ to } 4.8$$

The ratio is now much wider, and is, in fact, a little too wide, meaning that the mash could have a further ½ lb. of meat-meal added to it with advantage. This can be demonstrated another way. The complete ration of 108 lb. contains 12.81 lb. of digestible protein, giving a percentage of approximately 11¾ digestible protein, whereas a laying mash should contain between 14 per cent. and 15 per cent. digestible protein. It is of interest to note that the mash selected is the one so commonly used in the Dominion, namely, 2 parts pollard, 1 part bran, and 7½ per cent. meat-meal.

Poultrykeepers who are not inclined to make use of the formula described are reminded that the Department is prepared to check their poultry rations for them. It is essential, however, that the amounts of meals used in their mash and the grain fed should be supplied in terms of "by weight, in pounds," and not by measure.

(2) Mineral and Vitamin-content

It has already been stated that poultrykeepers are concerned only with vitamin A and vitamin D rich foods, and these only under certain conditions. Further reference to these vitamins will be made under Part 3. Good quality poultry foods contain a sufficient supply of all other vitamins necessary to poultry. As they are present in such minute quantities, no calculations are necessary or possible when compounding a ration.

It is customary today to add 2 per cent. of a mineral mixture to the average laying mash, and this, together with the minerals in the meals and grain, normally supplies the bird with an amount in excess of the total requirements. This small excess is not harmful to the bird, and is a safeguard against any shortage when a bird is in heavy production. Once again it may be stated that complicated mineral mixtures containing a multitude of different mineral ingredients are unnecessary for healthy birds receiving a normal mash mixture of good quality food.

(3) Bulk and Poultry Mashes

For the purpose of these articles, the bulk of a poultry food or mash can be referred to only in a general manner. Although fully appreciated by the dairy and pig farmer, it is not given sufficient consideration on the average by poultrykeepers. It is obvious that there is a limit to the bulk of food which a bird can contain or eat. Thus, if a laying mash is unduly coarse or bulky, the bird may apparently eat its fill, but the actual weight of a food ingredient consumed (that is, such as protein) may be well below what is required for egg production. On the other hand, a very fine mash may easily cause trouble, particularly with young chickens fed on dry mash, when the fine starchy meals will often clog on their beaks. Furthermore, a fine, dusty, dry mash may affect birds by getting into their breathing organs and causing irritation.

		2.06	22.08
(54 × .012) =	.64	(54 × .635) =	34.29
	2.70		56.37

For those interested and who have a 100 cubic centimetres glass measuring cylinder, any laying mash of which 1 oz. measures more than 70 cubic centimetres when shaken down in the cylinder is too bulky for high egg production. This is assuming that the mash is properly balanced for food ingredients in the first place. Soaked wheat feeding is a further excellent example where the bulk is greatly increased by water and the actual consumption of dry wheat by weight reduced. For this reason, care should be taken when using this system of feeding to see that the birds are consuming sufficient to maintain body weight. If not, then additional dry corn should be given.

(4) Palatability

It is assumed after close observation that poultry have only a very limited sense of smell and taste—the two senses normally associated with determining the palatability of food. Although this is the case, it is also recognised that birds have definite likes and dislikes as far as feeding is concerned, and in this connection the senses of sight and touch play a definite part. Any mash which may cause discomfort will be neglected or refused in time. As an illustration of this, a badly-made wet mash which is "tacky" or "sticky" may be cited. Furthermore, the presence of an excess of irritating fibre, such as may be met with in some lucerne-meals, will appreciably lower the palatability of a mash. In practice, the only sure way of judging the palatability of a mash is by trial with careful observation.

A detailed description of the theory of feeding has now been completed. The next article, which will appear in the May issue of the "Journal," deals with the practical issues of feeding, and will include a discussion on systems of feeding as well as typical present-day rations for all classes of poultry.

Cost of Producing a Dozen Market Eggs.

A DETAILED report upon the cost of production of market eggs during the season 1940-41 has now been prepared by the Senior Investigational Officer, Department of Agriculture. For reasons connected with the present shortage of paper, this report has not been published in the "Journal," but the report will apear *in full* in the *March* issue of the *"New Zealand Poultry World."* Readers are therefore strongly urged to obtain a copy of the "N.Z. Poultry World" for March, as this report is of particular interest and value to all poultrykeepers. Copies may be obtained from the Secretary, N.Z. Poultry Board, A.M.P. Buildings, Wellington, price 9d., post free, or 7/6 post free for an annual subscription.

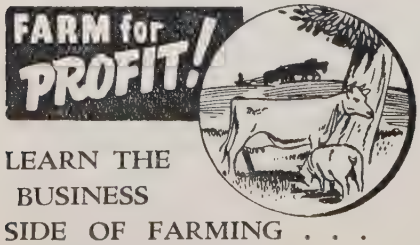
Federation of Young Farmers' Clubs

Clubs in Recess and Unattached Members

BECAUSE of depletion of membership and difficulty in securing attendances at meetings, a number of clubs are finding it necessary to go into recess for the duration of the war. Doubtless, it is the hope of the officials and members of these clubs that they may be able to revive them at a later date, but in the meantime attention is directed to the following resolution carried at the annual general meeting of the Federation last July:—

"All Clubs going into recess for the war period should hand over all books, funds, and vouchers to their District Committee, to be held in trust until such time as they (the clubs) are resuscitated." The reasons for this decision will be appreciated, particularly as such action will relieve individuals from responsibility.

For the benefit of members of clubs in recess who still wish to remain associated with the Y.F.C. movement, the following arrangement has been made:—Such members will pay their club membership fee of 3s 6d per annum to the District Committee (through the District Y.F.C. Secretary). They will be classed as "unattached members," and will be entitled to full membership privileges, including the concession rate of subscription to the "N.Z. Journal of Agriculture"; one shilling of their 3s. 6d. membership fee will be set aside for the "Journal" subscription, while the remaining 2s. 6d. will be credited to the funds of the club held in trust, as above, by the District Committee. Such members will be notified of District Meetings and will be entitled to take part in all district activities. It is hoped, from time to time, to include paragraphs and articles specially for "unattached" members in these pages.



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Junior Farmers' Clubs in N.S.W.

COPIES have been received of the winning essays in a competition for Junior Farmers' Club members conducted by Mr. J. A. Crawcour in his "Man on the Land" session over Station 2SM, Sydney. The winner of the senior section was George Cullen, Foxgrove, Gerringong, N.S.W., the subject being, "Why is the Junior Farmer of Today the Backbone of Australia Tomorrow?" His essay is given below:—

It is often said, and justly so, that the "primary producer is the backbone of Australia today." This term is easily understood when we consider the wealth accumulated in the national income by the export and the sale of our primary produce, and when we consider also the standard of living that is attained from a nutritional point of view by the abundance in our midst of primary products of the highest quality so essential for stimulating the health of the community in general. And so again, a new phrase has been coined, the significance of which must not be overlooked by the individual, the community and the nation.

That phrase is that "the Junior Farmer of Today is the backbone of Australia tomorrow." Why is this phrase so significant? Those of us who are privileged to be members of the Junior Farmers' Club movement, the scope of which is unlimited in its project work, in its fellowship, and in its co-operative spirit, should be able to supply the answer.

By doing project-work, we are self-taught from our own practical experience, thus a wealth of knowledge is gained which will, in due course, fit us for the tasks that lie ahead and the time when we in turn will be primary producers of the future. The carrying-out of project work, the keeping of records of those projects, the application of scientifific principles and the use of economy to improve our efficiency, so that we will have a continuity of supply of high-grade products, is surely an answer to that question!

Ours is a priceless heritage, and though we are only at the beginning, the reports of our activities that come to hand from time to time are definite proof that "the Junior Farmer of today is the backbone of Australia tomorrow."

Reports on Club Activities

MANAWATU.

Apiti.—Business meeting. Arrangements for annual meeting; Roll of Honour discussed.

Bunnythorpe.—Talks by club members as follows:—"Trees and Plants of Australia" (R. Clevely), "Japan and the War in the Pacific" (B. Fowler), "Diseases in Sheep" (A. Stewart), "The Platypus of Australia" (S. Anderson).

WAIRARAPA.

Alfredton.—Annual meeting; election of officers. Address by Mr. W. James, District Y.F.C. Chairman.

NORTHERN HAWKE'S BAY.

Matapiro.—Lecture by Mr. Whyte on "The Care and Attention to Mares and Foals." The speaker passed on some very valuable knowledge to his audience, such as the method of ensuring,

as far as possible, a successful foaling, and the ways of attending to the welfare of both mare and foal to the time of weaning.

Meeanee.—Arrangements for annual meeting. Because of the difficulty in obtaining lecturers on account of petrol restrictions, it was decided that at future meetings informal talks should be given by members. Interesting talk by Mr. Guthrie on "Handling a Young Horse." At the previous meeting the collection of ergot was reviewed, and a discussion took place in regard to various aspects of trespass and straying stock.

TE KUITI.

Paewhenua.—Annual meeting to be held in April. Lecture on "Veterinary Remedies" by Mr. H. E. Walters, Ngahape.

WESTERN BAY OF PLENTY.

Paengaroa.—Dance to be held. Lecture by Mr. Parsons, Rotorua, on "Potato Growing." The speaker maintained that in the Rotorua district even the poorest soil will yield a good crop of potatoes, ranging from 5 to 15 tons per acre, if treated in the correct manner. At the previous meeting one new member was elected. Mr. J. B. Cawte gave a talk on the Islands of New Britain and surrounding islands in the East Indies Archipelago; he dealt very fully with the lives and habits of the natives in their natural surroundings, and also detailed the strategic importance in the war in the Pacific.

AUCKLAND.

Harrisville.—Business meeting.

WARKWORTH.

Kaukapakapa.—Reports on calf club judging. Maize-growing project discussed. Talk by Mr. P. S. Syme, Department of Agriculture, on the results of manurial trials carried out by the club. Officers elected at the annual meeting:—Advisory President, Mr. M. McLean; Chairman, B. James; Secretary, F. Swinburne; Treasurer, I. Hellyer.

Club Membership Roll.

CLUB secretaries are requested to send in to the Organising Secretary, Y.F.C., Box 3004, Wellington, as soon as possible after the annual meeting of their club, a full list of their members. This is necessary for two purposes: (1) So that a complete roll of members can be kept at headquarters, and (2) in order that arrangements can be made for the monthly copies of the "Journal of Agriculture" to be posted to each member. In compiling this list, club secretaries will assist greatly by placing the names in alphabetical order as far as possible, and making sure that the initials and postal address of each member are correct. The names and addresses of new members should be sent in from time to time. Attention to these details will ensure that members receive their "Journal" copies regularly.

In this connection, it is recommended that club secretaries should keep a roll, similar to a school roll, recording attendances, etc.; this will prove a valuable record to the club.

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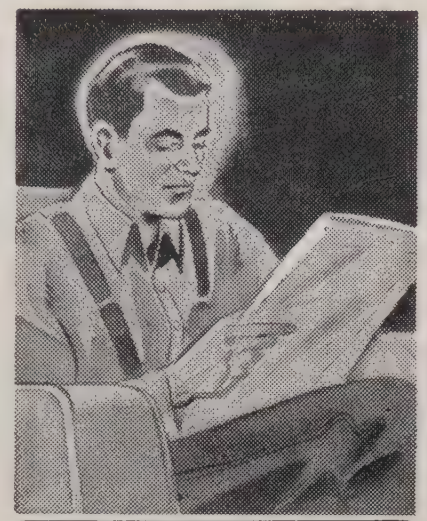
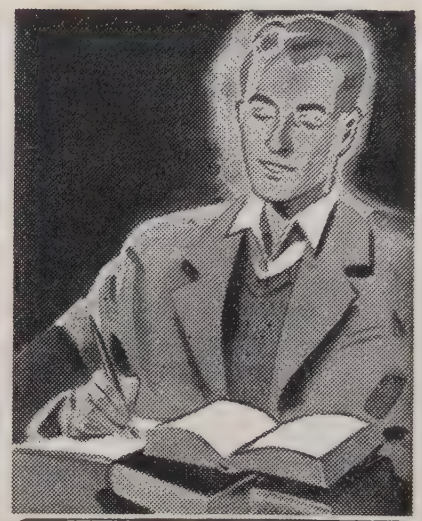


KEN WASTES HIS SPARE TIME AND PAYS LEGAL BILLS



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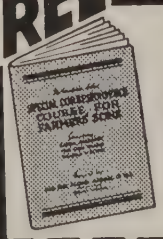

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Health Notes for the Farm

It's a Good Thing the Sun Is Still in Business

Contributed by the
HEALTH DEPARTMENT

THE war may have turned many things upside-down, but it has not been able to put the sun out of business—a fact which is of paramount importance at the moment to parents with growing children.

An hour's exposure to the sun each day will enable the child to assimilate the required amount of vitamin D in the absence of artificial substitutes. With the summer, such as it has been, coming to an end, an hour's real sunshine each day is harder to get, but there is still sufficient warmth to make a brief sunbath possible, and generally speaking, a pleasure. And, of course, the ultra-violet rays in clear or clouded sunshine—it is these which have the desired tonic effect on the young, growing bodies—are always there, no matter what the actual temperature is.

The war has badly upset the manufacture and supply of the fish-oils, such as cod-liver oil, upon which we have relied in the past as a very important source of vitamin D. Factories which prepared the oil have been destroyed in the general upheaval, and the risk to fishing craft in the northern hemisphere has resulted in a very limited supply of fish in this part of the world. Again, even if our shipping permitted us to get supplies from overseas, restrictions have been placed on the export of vitamin products from allied countries engaged in the conflict. These restrictions, if anything, are likely to be intensified.

It may be argued that we should make our own fish-oil preparations in New Zealand, but the answer to that is that even if the industry were flourishing, it could take care of only a very small proportion of our children.

Adequate Supply Imperative

Frankly, the position is serious.

Our growing children must get their proper supply of vitamin D. Without it sound health is impossible.

Briefly, vitamin D is the agent which transfers the raw materials, calcium and phosphorus, from the food to the bones, and enables them to be used to the best advantage. Without it the bones would be deficient in these two essential minerals. They would lack the necessary rigidity, and would develop that terrible bone deformity known in children as rickets.

Sunlight is the originator of all vitamin D. Some of the vitamin arises first in the plants that are subsequently eaten by animals and then becomes stored in the animal's tissues. Fish get it from marine plants, store it in the fat of the liver, and thus provide us with a rich source of vitamin D in the form of fish liver oil. It is that source which we now lack, and so it is to direct means that we must look.

There are people who are bound to say that if animals can absorb vitamin D in the normal course of their foraging, then children should be able to get it from the foods they eat.

Too Much to Swallow

Quite so. They can. But where are the parents who would ask their children to consume the following gargantuan meals, any one of which is necessary to supply the required daily ration:—8 eggs; or 1½lb. of butter; or 2¾lb. of ox liver; or 5lb. of lamb's liver; or 4½ gallons of milk? These are the richest known food sources. It is obvious that no natural combination of foodstuffs could supply the child's need. Compare this with one teaspoonful of cod liver oil per day, or ten drops of the richer halibut liver oil.

The sunshine tonic is safe and it is pleasant, and it should be continued as far into the winter as possible. Children in the country are often more happily situated than those in the centres, and even in the middle of winter—in the North Island, at any rate—a fairly regular sunbath should be available.

Care should be taken, of course, to see that there is proper protection from draughts and cold winds. When it is impossible to place the baby out of doors, the window may be opened and the baby placed directly in the sunlight with skin bared.

It is well to remember that sunshine passing through ordinary window glass loses its protective value.

Don't Overdo It

It is not necessary to expose vast portions of the body to the sun. A moderate amount of bared skin will manufacture all the vitamin D required for the current twenty-four hours.

Gradual exposure of the tender skin is necessary so that it will not become burned. Very young babies, and those with thin, clear skins, are more sensitive to sunlight than older babies or those with a dark complexion, and must be exposed even more gradually.

In schools, the children should be encouraged by the teachers to take their lessons as much as possible in the sunshine. The school routine should allow, wherever practicable, for a definite sunbathing intermission each day.

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THE Good Neighbour

BY MARY

From Me To You

"AUTUMN seems to be stealing on us this year, while we are still waiting for summer, and yellowed leaves are becoming a spot of colour along with red hawthorn berries." So wrote one of my "Good Neighbours" to me this month, and as I finished reading the letter, I glanced out of the window, and truly autumn had stolen in on us, all unawares. A poplar tree which a month earlier had been clothed in vivid green, had discarded her frock for a new one of deep golden tints, and the chrysanthemums were bursting into bud. Autumn —to many of us it is a sad time, as though the year was coming to an end, but to me it is always a glad time, for I love nothing more than to curl up in front of a blazing log fire—and fires are not part of summer, are they?

And fires always bring thoughts as companions—last night, in the firelight, my thoughts turned to the courage of the people of England today, and I remembered the words of a friend who had lately returned from the Old Country.

"Some of them have lost everything," she said, "but they still retain one possession prized above all others—their sense of humour."

And how true were her words. A sense of humour is surely the greatest possession anyone can own, and it takes more than bombs and hardships to destroy it. If a man can laugh in the face of adversity, then his is true courage. And how many folks there are alive today who always have a bright face to turn to the world, and a joke to share with a friend.

I wonder if any of you have come across the poem that is written as a prayer in little St. James' Church, at Waiho, South Westland? You know the church I mean, don't you—that beautiful little church that beyond its altar has a plate glass window, to allow the worshippers to worship also the untouched beauties of nature that surround this church, set in the heights of the Southern Alps. The last verse I will quote for you now—if any of you would like a copy of the complete prayer, just let me know, and I will be happy to send it to you.

"Give me a sense of humour, Lord,
Give me the grace to see a joke,
To get some happiness in life
And pass it on to other folk."

It is the sharing of a sense of humour that is so important. Don't be like the man who said he always kept his sense of humour up his sleeve, and only let it out on special occasions. Let yours always be near at hand, and ready to share with other folk.

Many of our possessions are going from us these days—hold fast to your sense of humour, and don't allow it to desert you. You may have need of it in days to come.

Mary

Mary's "At Home"

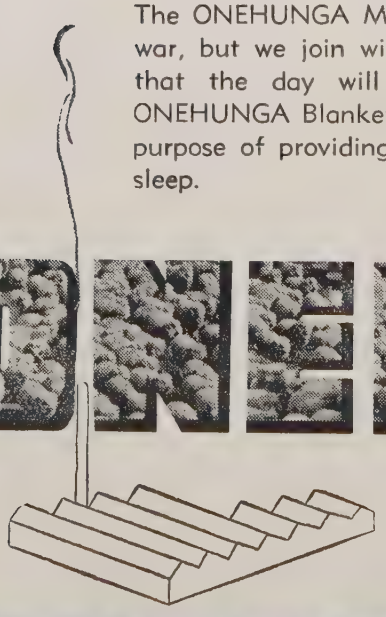
I DID enjoy your letter about judging by comparison, and I did chuckle, for it brought memories. As I told you, I was once a nurse, and whenever a patient was in with her second babe, I invariably heard this: "Oh, but Nurse, he (or she) is not as pretty as John was when he was a baby. You should have seen him." Sometimes they would be return patients, and then we would compare notes together, and if all was not in favour with the new babe, I would say: "Well, if you don't want him, I'll have him," and I would hear no more about it. Human nature is funny.—**Biddi-Jan, Redcliffs.**

I DID enjoy your February letter, Mary, and wish the message could be impressed on everyone. It is very annoying, this "harping back," comparing the present with the past. I believe it is the cause of much sadness, worry, fretting, and so on, not to mention the added lines on one's face. I have always prided myself on looking forward, for I am interested in tomorrow. Yesterday is gone beyond recall, so it is a waste of time and energy to think about it. If we failed yesterday, then we must win tomorrow, and we can only win by perseverance, and turning every ounce of energy to the purpose, whether it be making a cake, or winning the war. Eternal criticism and comparison must hinder progress, and ultimately cause stagnation. Indeed, those who branch out, and pioneer in a new direction, obtain a brighter and healthier outlook on life than those who remain in an old family rut. So let us be up and doing, and "hitch our wagon to a star." It is wonderful what desire and determination can do.—**Canadian Sal, Woodville.**

"HOW does your garden grow" is a most welcome and interesting article, especially to most farmers' wives, as I'm sure the majority of us have at least the flower garden to do. I know I love it, and prefer to do it myself, but oh, the days are not nearly long enough some times; all too soon it is dark. I have a huge lawn to cut, and my intention is to save up for a motor-mower. I have almost 100 pullets and one-year-old hens, and so hope to be able to have my motor

Salute to MEN WITH WINGS

Men who live a lifetime in a split second need the best in rest and relaxation—and that's where ONEHUNGA Blankets are TO-DAY! Should you have any difficulty in obtaining your full requirements of Onehunga products, remember that the needs of the forces come first. The ONEHUNGA Mills are weaving for war, but we join with you in the hope that the day will soon come when ONEHUNGA Blankets will return to the purpose of providing you with peaceful sleep.



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by next spring. Let's hope we are all safe, and the war over by then. Things are not very bright these days, but we must wear a smile, and carry on for everyone's sake. I have a small vinery and grow quite a number of grapes, which are almost ready. It is fascinating watching them ripen, but I can quite understand now why grapes are so dear, as they are a lot of work.—**Judith, Oamaru.**

AUTUMN seems to be stealing on us this year, while we are still waiting for summer, and yellowed leaves are becoming a spot of colour along with red hawthorn berries. Like Helen, I always feel guilty when I take these berries for decorations, even though the birds have stolen our plums and apples, not to mention a few precious apricots. We have a bright bed of pom-pom dahlias, and sunflowers are doing their best against the wind.—**M., Feilding.**

I WONDER if I have spoilt my children—and I have nine of them—for I rarely smack them, should they do wrong; I always speak softly to them, preferring always the truth, and no matter how bad the deed or damage they have done they are never punished. They have no fear, the truth prevails, and after all, who are we to judge another? as Shakespeare says. My home is never tidy. I clean it once a day, and should it get untidy after that, it matters not so long as it is clean, and the children are happy. They are allowed to touch whatever they like, and I am always careful to see that they replace any article they may touch when they have finished with it. Forbid a child anything, and he will do his best to reach the object.—**M.W., Matamata.**

THE blackberries are delicious just now, hardly a grub in a whole basketful. So far, I have preserved seventeen bottles, so if you are feeling like blackberry pie during the winter you will know where to find one occasionally. I made some blackberry and damson jam this morning, and it is delicious. I strained the berries, and added a pound of juice to each pound of sugar. Last year I made rhubarb in the same way—it has a flavour all its own. There is such a lot of cooking needed for this family of healthy appetites, and a bit of experimenting relieves the monotony.—**Mary Ann, Bell Block.**

I WAS ever so thrilled to get first prize in the January competition, and I followed my usual practice with chance money. I divided it into three: One-third for National Savings, one-third for my own savings (in this case I am collecting for a winter costume), and one-third for immediate spending. I'm afraid I'm not very thrifty—I like to spend. I spent two and fourpence on two Penguin books, the two volumes of Apsley Cherry-Garrad's "Worst Journey in the World." I cast envious eyes on the 17s 6d edition of the same book which was displayed temptingly in the same shop, then consoled myself with the thought that after all one gets the unabridged text in the Penguins. Today, when everything seems upside down, and no one knows what is going to happen next, the story of how Scott and his companions journeyed and died is an inspiration for us all. But I've forgotten about that last eightpence. It paid for the major portion of my ticket to see the film "Lady Hamilton," a wonderful film. But couldn't they have given us more of Nelson and the sea, and less of the "lady" and the land?—**Khorasbad, Marlborough.**

MY litle girl is eleven, and my little boy nine, and both are a great help to me in these busy days. It is with school supervision that I have had the most fun, because my son, one of the jack-in-the-box type, wants to try to teach his mother at times, she, of course, being old fashioned. I have to smile when along come words and exercises from school just as I have suggested. I try to make the children sturdily independent, and as thoughtful of teachers and others as possible. I have brought them up with the idea that if one benefits in a home from all the numerous tasks necessary to be performed there, then everyone should share happily in doing them. In this way all the work does not fall on one pair of willing shoulders—one person is not expected to keep the ship on its course.—**Tiggety Boo, Kati.**

MATRIMONY, if successful, is essentially co-operative. If a man is going to be an ideal husband, he must be wise enough to choose a wife with whom he can co-operate, for tastes differ so much. Some women want to sit on a cushion, and sew a fine seem, and have their big, dashing husband fetch and carry, decide and provide. Others want to be up and doing, ready to help and plan, and bear their share of the load.

But all true women have as their ideal a man who will be loyal to them through thick and thin. The man who gives his wife a fair share of the family income to provide for the needs of herself, the family, and home, is ideal in this respect. Kindliness, expressing itself in good manners, consideration, pleasant relationships with children makes a man desirable.

Give me the man who, with his beloved, will start out with this motto:

There's just one way of loving that is fair,
You must give and take alike, and share and share;
Never grudge each other's work or play or laughter,
Make your love to last through all this life and after.

—**Hay, Straw, Donkey Feed, Kaukapakapa.**

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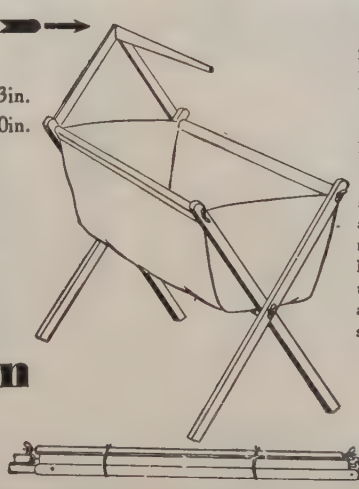

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BAD WEATHER BRINGS OUT THE BEST IN A RAINSTER

Checks Are Just IT!

CHECKS are the highlight of fashion this winter. Everywhere you go where smart folk are gathered together, checks predominate. And the gayest colours! The shop windows are full of the most fascinating materials—green checks, flecked with scarlet and orange; blue checks with contrasting squares in deeper tones and all the prettiest patterns imaginable mingled together. And check coats are stylish too: I have seen them cut on slim lines that flatter the lines of your figure, and others are swagger, or the "swing-back" type. But whatever the cut, whatever the shade, the material must be check if you are going to be in the swing this season. Despite war conditions, the city shops are displaying extensive ranges of winter materials.

Wool is hard to procure. Now and then some lucky ones go home triumphantly carrying with them some wool they have managed to chance upon in a shop which has had—for a few hours only!—a new shipment.

As for stockings—well, they are simply almost a thing of the past. Goodness knows what we are going to do when winter comes—I suspect a return to the knitted knee-length stockings of other days—not very alluring to look at, but at least a comfort to those unfortunates who suffer from cold feet.

What do you think of "Wedgies"? They are the latest innovation in the footwear line—they look a little clumsy to me, but I am assured they are the acme of comfort. Wedgies are made in a variety of colours, and combination of colours too, so you won't have any difficulty in getting shoes to match your new check coat when you have found the one you want.

Hats don't seem to be extraordinary in any way at all. On the contrary, it seems to me that hat fashions are returning to the old sensible days when a hat was a hat instead of a small piece of material that perched on the side of the head.

I really thought that frock fashions would become dull with the advent of so many uniformed girls in the city streets. But these uniforms add to the attractiveness of the crowd—the Air Force blue uniforms are always smart and neat, the girls of the W.W.S.A. are everywhere today in their uniforms of khaki with their smart caps, and there are numbers of young girls about the streets in the uniform provided by the Post Office for their telegraph girls. And those girls who are not in uniform are making a desperate effort to keep themselves looking smart and colourful, despite the war conditions.

Gay colours are being worn on every side, accessories are colourful, and what is more important than anything, spirits are at their highest when things don't look so bright. If things look blue to you, just try out this recipe: a new check coat, a new hat, perhaps even some new shoes, and believe me, if you don't feel "a million dollars," as the Americans would say, then I will be surprised!

Bonita Granville, star of Metro-Goldwyn-Mayer studios, marches at the head of the fashion parade of today in her new check sports coat in rust, orange and brown. And she feels just it, too!

Mary's Song.

O, Mary the maiden walked in the meadows,
And Mary the maid was alone;
O, she sang a small song as she tripped through the grasses,
And the song was of joys of her own.
O, Mary the maiden walked in her garden,
And tall was the lad by her side;
O, Mary's heart sang, for her joy and her gladness
All sadness and sorrow defied.
O, Mary the mother walked with her treasure,
The tall trees green banners unfurled,
O, Mary's heart sang, and this song the sweetest,
The mother-song of the whole world.

Helpful Hannah Says . . .

Never throw away the water in which potatoes have been boiled. It is good for removing the stains from the inside of aluminium teapots. Fill the teapot with the water, and leave it to soak for some hours.

* * *

Marks on soiled raincoats can be removed by sponging with lukewarm water and a little ammonia. Rinse by wiping with a flannel wrung out in clear warm water, and rub dry.

* * *

Whitening, damped with a little ammonia, will often remove tarnish stains from brassware. Afterwards polish in the usual way.

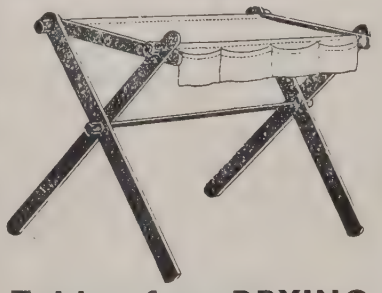
* * *

Before beginning your day's cooking wipe the top of the stove over with a little vinegar, and all cooking odours will disappear.

* * *

A few drops of methylated spirits added to the rinsing water when washing white or cream silk gives a beautiful gloss to the material when ironed.

Another "Roylete" Nursery Design—



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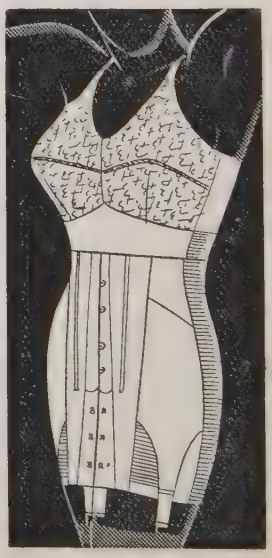

Berlei

FOR THE MATURE FIGURE

Our Competition

MY STRANGE IMPULSE

WELL, you certainly have told me of some very strange impulses, and some of them are every bit as strange and unexplainable as mine. I only hope that the reading of them doesn't stir up strange impulses in other folk, who perhaps will be a little bolder, and will venture to carry some of them out!

First prize this month goes to "M.," Feilding, and second to "Lifuka," Motueka, with "Robin Redbreast," Waharoa, highly commended.

First Prize

MY strange impulse—which shall I tell of? Well, here are two things that the imps of Satan make me long to do. First let's imagine we are at the pictures, and as the plot becomes more thrilling, the folks in front seem to be a bobbing hat rack. Now my strange impulse is to leap up, and with a stick make one clean sweep along the row, leaving all heads bare! And the second is just this—to switch off the electric light as I leave a room, leaving the rest of the people in darkness. Silly little things, but my word, how my hand itches for that "clearing stick," and for the flick of the switch! —**M., Feilding.**

Second Prize

SILLY as it may seem, Mary, you reminded me of my own strangest or maddest impulse when you mentioned yours (incidentally, I've always wondered what happens next when anyone does get up and object, when the minister asks that particular question?) At my own wedding, I was suddenly smitten with an almost uncontrollable desire to say "no" instead of "I will." It just came into my head, what a shock people would get—himself most of all perhaps!—and I had quite a job to get safely past with a meek "I will." No, I've never told himself, but just at the moment, I've an impulse that I'd like to, just to see what he would say.—**Lifuka, Motueka.**

Highly Commended

I ALWAYS want to pull the emergency cord, and stop the train. I can hardly keep my fingers off it. When a child I could not resist biting my dad's finger when he lay asleep on the couch. Then dad got such a fright that he bit too!—**Robin Redbreast, Waharoa.**

MY strange impulse? Picking up pins. I can't resist them. Even in the street, when my white gloves are temporarily spotless, a furtive duck, and I've added another to the collection. Generally I lose it immediately afterwards, but that doesn't matter, because—I should blush to admit it—it's the traditional wish that goes with it that attracts me, and the day's quota of good luck. Once my wish dealt with such material affairs as refrigerators, suitable sums of money for the pet project of the moment, and so on, but now each and every pin is a V for Victory wish. Personal affairs don't seem very important somehow, and, after all, thoughts are things, so perhaps my oddity does help a little. Anyway, I see one glittering on the hearthrug, and we can't afford to risk anything just now, so please excuse me!—**Arabella, Waikato.**

AS a child I got myself into quite a bit of bother with my strange impulse, which caused me to prick any blisters of paint, and so mar the doors and window sills of my home whenever the sun caused the paint to raise up those tempting little blobs. But I outgrew that one. Now I should like to break an ugly ornament in a home I frequently visit. I admit that what seems junk to me is a treasure to them, for some unknown reason. I've been staying there recently, and doing the dusting, and feeling that I would love to send the piece of ugliness flying into lots of bits. Instead—and here is the strange impulse ruling me—I handle the eyesore with extreme care, because I feel that it would be so very, very easy to yield to the temptation to let it drop.—**Laurel, Feilding.**

I HAVE a strange impulse which bothers me sometimes when I happen to be at some more or less informal afternoon or evening at somebody's home. Everything goes merrily, and the room is filled with chatter and laughter. Then suddenly a silence, the kind of silence which is not golden, but seems to shout. Imagine me, then, digging my toes down into my shoes in embarrassment, while desperately I restrain an impulse to shout with crude and unmannerly laughter. For I know that everybody in the room, including myself, is delving down into their wits for some suitable remark to bridge over the gap in the conversation. I venture to say that I am usually the one to take the verbal plunge. Even though my remark may be hopelessly trite and foolish, I feel that I cannot bear the strain of the silence another split second without committing an unforgivable breach of social etiquette by laughing outright at such an awkward and inauspicious moment.—**A.M.D., Inglewood.**

FOR years my strange impulse has also been a great worry to me, for I have had this impulse ever since I can remember. I love the sea, and would dearly love to travel, but so far my sole effort in travelling by sea is to cross from one island to the other. This I can do, as I go straight to bed, and do not stir out of my cabin until the gangway is down. For whenever I stand and look down into the sea, I want to jump in. For years I have searched for a reason for this impulse, but so far I have not found one. I dare not stand on a pier, or go out on far rocks, unless I have a friend with me, and even then it is no pleasure for me. I am a good traveller, and have never been sick, so I cannot offer that excuse. I only hope that some day this strange impulse will leave me, and then I will feel free to travel without fear.—**Biddi-Jan, Redcliffs.**

Music Has Memories

MUSIC has strange powers—to everyone of us, I am sure, there lies some strange appeal in a particular piece of music because of the memories it recalls. Sorrow and joy, romance or heartbreak —what memories does music bring back to you? Every time I hear "The Ash Grove" I remember back to my schooldays—what happy times they were!

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¶ Closing Date: 20th May, 1942.

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...laughter is when there is no joke.
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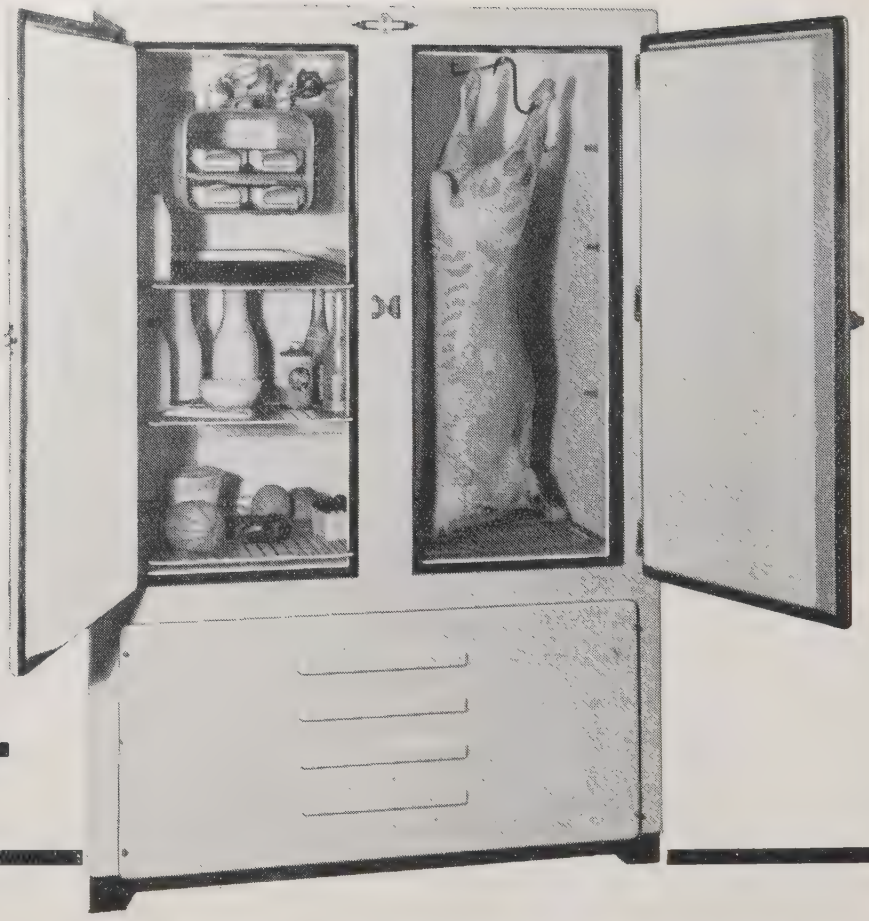
...faith is after we have made sure of all the facts.
...caution is before the danger has appeared.
...reducing is before we have put on weight.



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Are You a P.P.?

ARE you a P.P.? Well, I suppose you are wondering just what these cryptic capitals stand for? They could stand for a variety of things, but in this instance they just stand for two words, "Popular Person."

The popular person—we all know someone who answers exactly to those two words. The popular person is everywhere—she is not always pretty, perhaps not even attractive, but nevertheless her engagement book is always full, and wherever she goes she is the life and soul of the party. That is why she is a Popular Person.

But have you ever studied one of these people, and analysed just what it is that makes for this popularity? You will realise of course that not everyone is popular for the same reasons—some people are popular because they are always gay and cheerful, and others because of their never-failing kindness. But whatever is the predominant feature of their popularity, there are certain features that are present in the make-up of all these popular people.

Let's take Joan, for example. Joan is always the centre of attraction at every party she goes to, always the first person invited to these parties. But she doesn't go to every party she is invited to. Therein lies one of the secrets of her success: she knows when to say "No." When she is feeling off-colour, she is honest, and says she would rather go home to bed for the evening. She does not bore her fellow-guests with her troubles because she is a little tired, and consequently they only know her when she is feeling her bright self. Wise girl, she knows when to say no. Joan never tries to be any better than her neighbour — never outshines her partner.

I remember how she said she couldn't dive one day when we were all together at a swimming party, and it was only because she had brought with her a cousin from town who wasn't used to the water as we were. All the time she stayed with her cousin, while we were plunging off the diving board in fine style. But the cousin worships Joan for it. And Joan, wise girl, realises that it doesn't do to become any better than her friends at anything—at least, not outwardly—for it only leads to jealousy and ill-feeling.

Another sterling quality she possesses is her honesty. If she is asked for her opinion on anything or anyone, she always gives a candid reply. One can be candid without hurting feelings unnecessarily. And we all know the value of a friend to whom we can put an honest question, knowing we will receive an honest reply. Joan never makes excuses—it is always the truth. If she finds she cannot go out with her friend as arranged, then she tells her the real reason why the outing has to be postponed. Or perhaps it is an outing with him that has to be put off. Well, it makes no difference to Joan—she treats her girl friends in the same charming way as she treats her boy friends, and she never breaks a date with her girl friend because something more ecxiting has turned up with her boy friend. Her word, once given, is not lightly broken.

Always Joan is considerate. And her consideration is coupled with kindness. She always has a ready and sympathetic ear to lend to the troubles of her friends, and she is always a good "listener." Very few of us possess that remarkable quality of being a good listener—we are usually always ready to air our own grievances, without lending an ear to the grievances of our friends.

We all worship Joan. She is always ready and willing to lend a hand when wanted, and doesn't wait to be asked. We can rely on her to look after the family for an evening now and then when we want an evening off—she does it cheerfully, and doesn't bemoan the fact that she is sitting at home beside our fireside, minding our children, when she might be going off to see the latest movie. She is glad, always, and willing ever to lend a hand.

And popular—well, she has more friends than everyone else I know put together, but they are true friends, and will be true friends all her life. When trouble comes to Joan, she will meet with plenty of willing help and ready sympathy, because she has always been so glad to help other folk in their troubles. So far Joan has had no great troubles, but when she is called upon to suffer she will do it with the same ready grace, and will meet it with the same bright smile that she gives to us whenever we call at her place now—Joan is likeable and lovable because she is always cheerful and willing—she is a P.P. with capitals.

After all, popularity is not so much a matter of having people like you as it is a matter of liking people.

. . . How Does Your Garden Grow?

WITH the winter approaching, it is well to repair drains, walks, and drives. Drainage is of first importance, but efficient working is maintained only by regular attention in season—trimming down the sides of open drains and water-tables and removing silt deposit to restore the original grades and clearing the outlet of underground drains and culverts are seasonal attentions of the greatest importance. Without these attentions drainage soon becomes merely an illusion, and gardens and crops suffer in appearance, condition, and production. Repairs to walks and drives by spreading road metal, as may be necessary, to restore a well-graded surface adds much to the appearance and convenience of the home by providing clean, dry access. The wear in roads and walks is usually greatest in gateways and entrances where the traffic converges, and these areas should be given special attention.

Where new walks are necessary, they should be excavated to a depth of about six inches, filled with stone or clinker, and finished off with fine gravel or chips. A pleasing effect is sometimes obtained by filling with broken brick and finishing off with brick chips. For permanent effect good drainage must be provided by means of sumps and culverts, as required, to carry off flood water.

Next to drainage, good wind shelter is essential for the homestead garden in New Zealand. Shelter belts and hedges should therefore be carefully maintained or thoughtfully planted where they are not yet established. The valuable service they render repays handsomely the trouble taken. Where it has not already been done, hedges should now be trimmed, taking care to keep the top narrower than the base, which has the effect, among others, of keeping the basal growth in good condition. Where shelter planting has not been established, manuka hurdles laced with wire render are useful while the young plants are growing up.

Some of the main points to be observed in planting this feature are to provide shelter which is adequate to the conditions and purpose but do not overhang the buildings and crops, and to select plants which will do this effectively with little or no attention in the way of trimming and topping. The last and most important is to plant only good, sturdy plants and give them all an equal chance. For the best results those chances must be good, and on light land liberal treatment to give the plants a good start will be well repaid.

In the vicinity of the dwelling well-kept trimmed hedges are attractive, but they are sometimes overdone, causing unnecessary work, and sometimes occupying a position where a comparatively invisible wire fence would perhaps look much better, as, for instance, on the leeward side of a garden. Where the garden is adjacent to paddocks or a roadway, good stock-proof hedges of such plants as barberry or boxthorn may be warranted, while sections of the garden may often be attractively divided by a hedge of *Cydonia japonica* or varieties of Camellia, when pruned, and not trimmed with shears. They easily make substantial and attractive hedges up to about 9 feet high. The latter should be planted only for this purpose in a deep loam which is unlikely to dry out at any season.

Many species of the native Olearias and Pittosporums make fine shelter hedges up to 10 feet high in exposed positions with comparatively little attention. For low hedges of a more formal type, *Ligustrum* (privet), *Lonicera* (honeysuckle), and totara are often very suitable. Species of Escallonia are popular, and flowering hedges of Abelia or *Correa alba* are uncommon. In mild localities Tecoma is a favourite, and, exposed to sea winds, Taupata (*Coprosma Baueri*) cannot be beaten for a garden hedge of moderate height. For a higher hedge in such a position pohutukawa (*Metrosideros tomentosa*), planted 3 to 6 feet apart, is excellent.

—WM. C. HYDE, Horticulturist, Wellington.

What To Do During May.

Repairing and draining established gardens.

Planting and trimming hedges and shelter belts.

Laying out new gardens.

Storing and using organic waste.

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Mary's Mixing Bowl

Feathery Sponges

THE prize of 2s. 6d. for the best sponge cake recipe is awarded to "Poppy," Hokianga, for the following entry:—

LUXOR FOAM SPONGE.

3 eggs, 1 cup sugar, 1 teaspoon baking powder, 1 cup sifted flour, 1 tablespoon hot water.

Separate yolks from whites. Add baking powder to the yolks with a little cold water. Place basin over a dish of hot water and beat until yolks are light in colour. Add sugar gradually and whisk for 5 minutes. Whisk in hot water, then add sifted flour, blending carefully. Add stiffly beaten egg whites and fold into the mixture. Bake in a tube cake tin in a slow oven for about 45 minutes. Cool and fill with the following filling:—

Lemon Curd and Cocoanut Filling.

4 oz. sugar, 1 oz. butter, 2 eggs, 1 large lemon, 2 oz. cocoanut.

Melt butter in saucepan, add sugar, rind (grated), and juice of lemon. Beat eggs and add. Stir over fire until boiling. Cool slightly and stir in cocoanut. Split cake through the centre and fill. Spread top with whipped cream and decorate with sliced bananas and halved walnuts.—**"Poppy," Hokianga.**

CREAM SPONGE.

1 small cup of sugar, 3 eggs, ¼ cup of flour, ¼ cup of arrowroot, 1 teaspoon of baking powder.

Beat sugar and eggs till fluffy; add sifted flour, arrowroot, and baking powder (just fold in). Bake in moderate oven, if electric at 375, top off, bottom low. Fill with whipped cream, either plain or with jam or fruit added. Do not ice.—**"Matilda," Te Puke.**

GINGER FLUFF.

4 eggs and ¾ cup sugar beaten together for 15 minutes, then add mixed together 2 dessertspoons flour, ½ cup arrowroot, 2 teaspoons ginger, 2 teaspoons cinnamon, 1 teaspoon cocoa, 2 teaspoons cream of tartar, 1 teaspoon baking soda, and lastly 1 dessertspoon melted golden syrup. Cook as usual and fill with whipped cream and dust with icing sugar.—**"C.E.T.," Hawera.**

FEATHER SPONGE.

1 cup of sugar, 3 eggs, 4 tablespoons milk, cup of flour, 1 tablespoon butter, 1 teaspoon baking powder.

Beat eggs well, add sugar and beat again, then flour and baking powder mixed. Boil milk and butter together, and add while boiling to the rest of the ingredients. Cook in sandwich tins, about 20 minutes (moderate oven).

Fairy Filling.

3 tablespoons butter, 3 tablespoons sugar, 1 tablespoon milk, 3 tablespoons boiling water.

Beat butter and sugar together, add boiling water, and beat again, let cool a while, then add milk and beat again. —**"Mu," Morrinsville.**

New Ways With Potatoes

WHAT would we do without our good old friend, the homely potato? Every day we make use of it, so what about some suggestions for new ways with potatoes?

Send your ideas to the "Mixing Bowl." 2/6 for the best recipe received by the 20th May, 1942.

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BLOW AWAY SPONGE.

Beat together for five minutes 3 eggs and ½ cup of sugar, add 1 teaspoon warmed golden syrup and beat again for 10 minutes. Sift ½ cup of arrowroot, 1 teaspoon flour, ½ teaspoon baking soda, 1 teaspoon cream of tartar, ½ teaspoon of ground ginger, ½ teaspoon of cinnamon, and 2 teaspoons of cocoa. Stir into eggs lightly and bake in 8 in. or 9 in. sandwich tins in moderate oven 10 minutes. Any filling, but whipped cream or marshmallow is delicious.—**"Sue."**

ARROWROOT SPONGE.

½ cup arrowroot, ½ cup sugar, 3 eggs, 1½ small teaspoons baking powder, 1½ small teaspoons flour.

Beat sugar and eggs 10 minutes, add dry ingredients, and bake 20 minutes. —**"N.C.," Christchurch.**

BANANA JELLY SPONGE.

4 eggs, ½ lb. sugar, 2 tabs. boiling water, ½ lb. flour, 1 heaped teas. baking powder, few drops of vanilla essence.

Beat eggs and sugar well, add water, beat again; sift in dry ingreds. Bake in round buttered tins in good oven. Have ready a cherry jelly set with sliced bananas in it (jelly to be set in mould the same as cake tin). Split cold cake, put first a layer of stiffly-whipped cream, then jelly top with another layer of cream. Put on top of cake. Pipe roses of whipped cream in cake and have thin ribbons of jelly dividing it into sections.—**"M.," Feilding.**

FAIRY SPONGE.

Beat 3 eggs with 1 teacup of sugar 10 minutes. Add 1 teacup flour, 1 dessertspoon warm milk, and 1 teaspoon baking powder.—**"Mac," New Plymouth.**

FISH POTATOES.

For each person bake a large potato in the oven in its jacket. When done, cut off tops lengthwise, scoop out contents of each potato, beat it up with milk, butter, pepper, and salt, and keep hot. Flake sufficient cooked fish to make 2 cupfuls, mix it up with a few chopped shrimps, and 1 cup of cheese sauce, and fill potato cases with mixture. Fork tops, brush with beaten egg, and put in oven till brown.

HONEY NUT TOAST.

Toast a slice of bread, butter, spread with candied honey, and place in oven for 1 minute to partly melt honey. Cut each slice into fingers, sprinkle with chopped peanuts, or place a blanched almond on each side, and serve hot.

PEAR HONEY.

Take 1 peck of just ripe pears, peel, core, and put through a mincer. Weigh, and put into preserving pan with 8 oz. of sugar, and one breakfastcupful of water to every pound of fruit. Bring to the boil, and add a grated pineapple, and the juice and grated rind of two lemons. Let simmer for two hours, put into jars, and cover at once.

Table of Contents—April, 1942

A Vegetable Garden on the Farm—D. K. Pritchard .. 225
Lime Responses on Grassland—A. G. Elliott and P. B. Lynch .. 231
Castration of the Ruptured Pig—Livestock Division .. 241
Subterranean Clover (Canterbury)—J. P. Beggs .. 245
Waimate West Demonstration Farm—J. E. Davies .. 257
Slaughterings of Stock—Livestock Division .. 261
Veterinary Notes—Livestock Division .. 263
Farm Practice and Management—Fields Division .. 269
Radio Broadcasts .. 272
The Orchard and Vineyard—Horticulture Division .. 274
Guide for the Home Garden—Horticulture Division .. 276
Apiary Notes—Horticulture Division .. 278
Poultry-keeping Section—Livestock Division .. 279
Young Farmers' Clubs—S. Freeman, Editor .. 282
Health Notes—Department of Health .. 284
"The Good Neighbour"—by Mary .. 285

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BOILED SALAD DRESSING.

Beat 2 eggs well, add 1 teaspoon salt, 1 tablespoon mixed mustard, 1 tablespoon each of milk and butter, 2 tablespoons sugar, 3 tablespoons vinegar.

Stand bowl containing mixture in saucepan of hot water, and stir until the mixture thickens. Bottled tightly, this will keep for several months. When needed, add a little cream or milk.

SAVOURY EGGS.

Boil number of eggs required till hard and pop into cold water (so that the yolks won't go black). Shell eggs and cut in half. Remove yolks and mash well with salt, pepper, butter, and a little mustard to taste. Refill the whites with the mixture and put each half on a lettuce leaf and pour over a nice salad dressing.—**"D.M.B.," Whangarei.**

SAVOURY BISCUITS.

1 cup flour, 2 tablespoons butter, ¼ teaspoon salt, ½ teaspoon curry powder, little pepper, a dash of cayenne pepper.

Rub butter into dry ingredients and mix to pliable dough with milk and water. Roll very thin, bake in moderate oven. Prick with a fork before cooking. Crisp, tasty, and perfect as a foundation for any savoury. Top with a sardine, slice of tomato, hard-boiled egg, beetroot, etc. Or serve perfectly plain, with a spread of butter. Is economical, as it makes a large quantity and keeps well.—**Mrs. Arch. Fry, Motueka.**

GREEN PEA SALAD.

Cooked peas, 1 lb., 2 small lettuce, 2 tomatoes, 1 boiled egg (hard), 3 tablespoons salad dressing.

Mix the peas and dressing together. Tear or slice the lettuce finely and arrange as a border round the peas. Garnish with sliced tomatoes and egg.

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